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Plant for Large Output of Die Castings

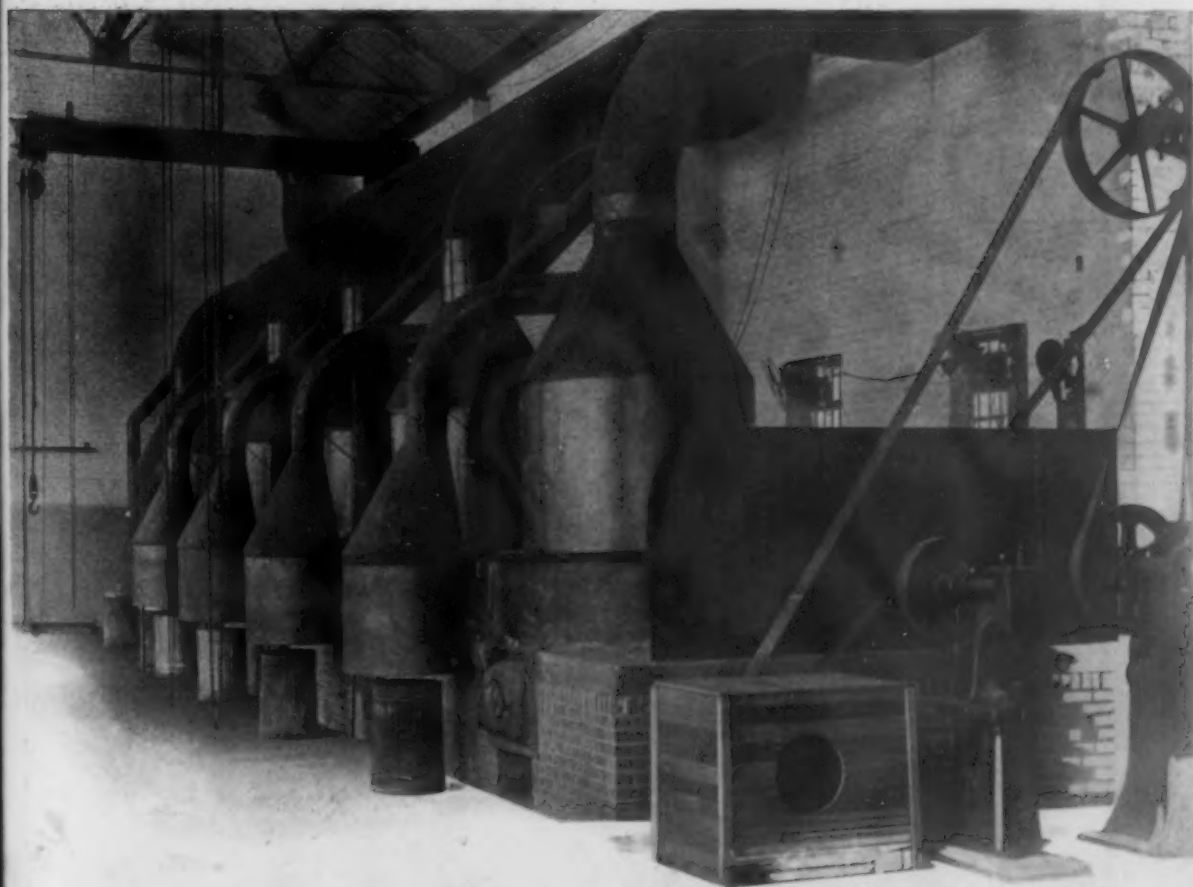
Arrangements to Reduce Production
Costs of White Metal Parts in Toledo
Works of Doehler Die-Casting Co.

THE demand for white metal castings has grown remarkably fast in the past few years as a result of their increased use in the automobile and other industries that have experienced a marked development, and the growth of the die-casting industry has kept pace with the demand. The increased use of these castings can also doubtless be attributed to some extent to improvements in the die-casting process, including the development of better machines and the making of larger and more complicated die castings than formerly.

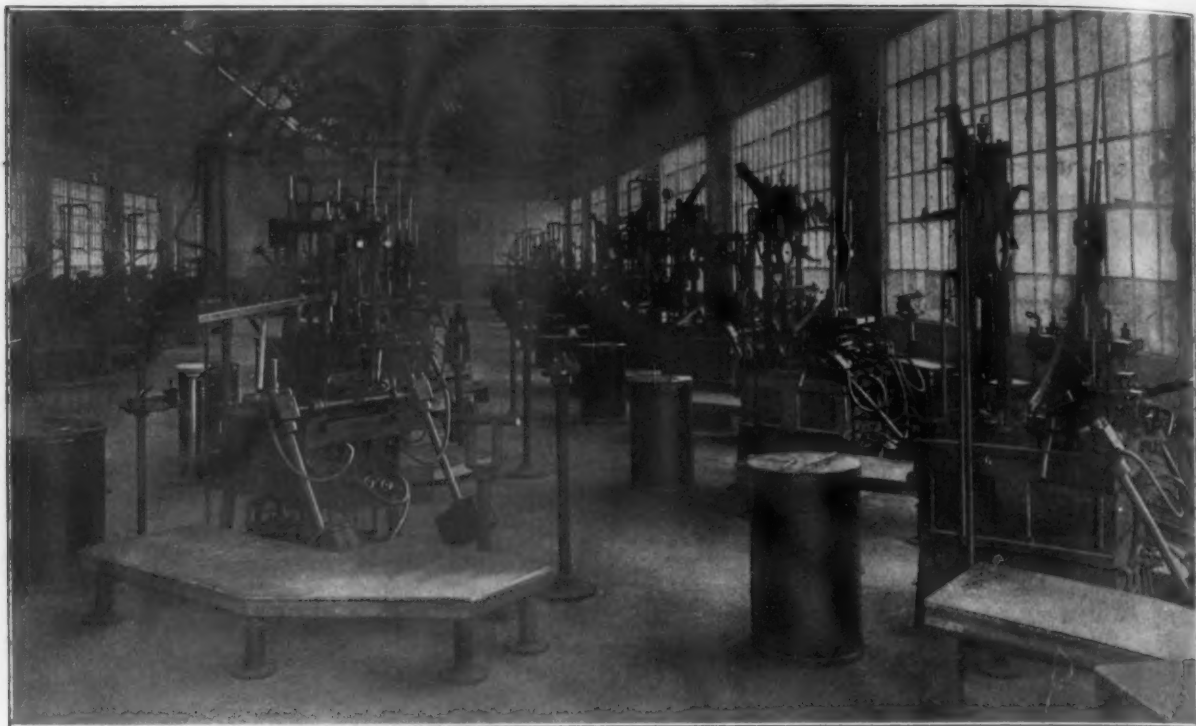
Five years ago the Doehler Die-Casting Co., Brooklyn, N. Y., established a branch plant at Toledo, Ohio, the location being near the center of the Central Western automobile field. That plant, which occupied 20,000 sq. ft. of floor space, soon proved inadequate to supply the growing demand of its trade and a new one has been built recently with 80,000 sq. ft. of floor space. This is of the

most modern type, designed to meet the special needs of this industry, and provides for economical quantity production by the arrangement of its various departments and the routing of material in the process of manufacture, without the loss of time and labor. Its products include die castings of white metal alloys used for various automobile parts and automobile accessories, such as parts for ignition and lighting systems and magnetos, speedometer parts, gears for oil pumps, windshield nuts, fuse plugs, etc. Outside of the automobile field large quantities of white metal castings are now used in talking and vending machines, and the process is now used to some extent in making munition parts. Another important product of the plant is bronze back babbitt-lined bearings that are largely used in automobiles.

The plant consists of two parallel buildings separated by a wide paved court. The main building is



A Battery of Six Furnaces Each with a Capacity of 1000 Lb. and Using Either Coal or Gas Fuel Is Employed for Melting and Mixing the Metals That Form the Various Alloys Entering into the Production of Die Castings. The output of the furnaces is 8 to 10 lb. ingots ready to go to the melting pots of the die casting machines



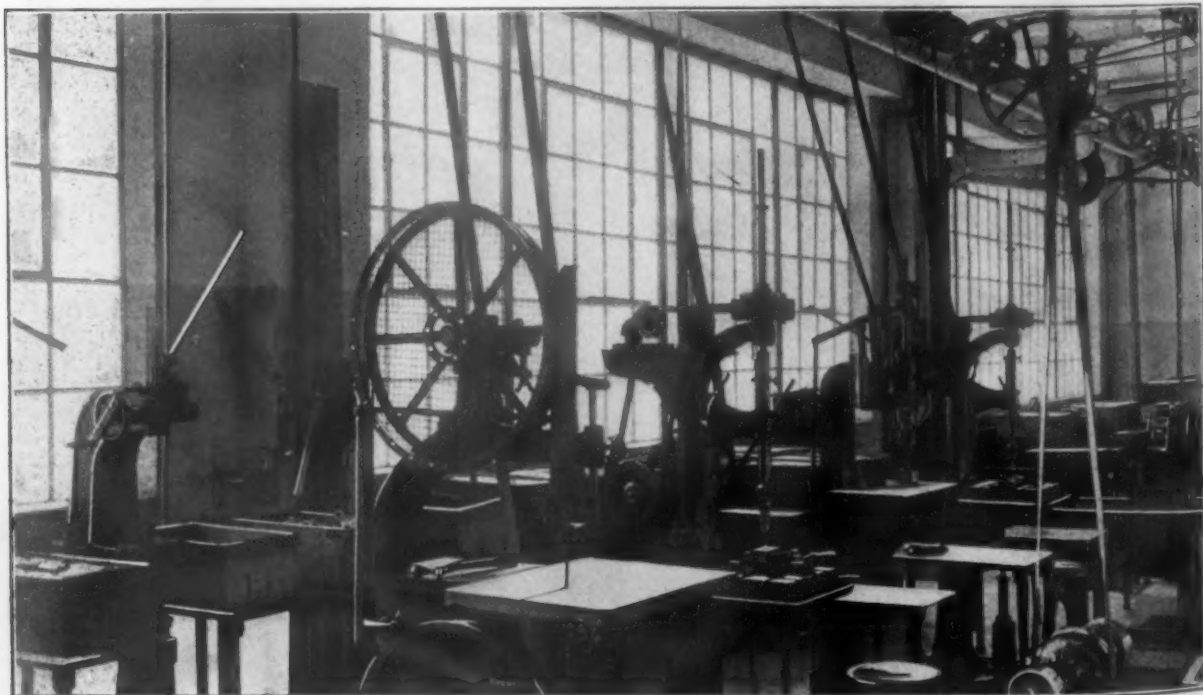
Most of the Machines in the Die-Casting Room Are of an Improved Type in Which the Molten Metal Is Forced into the Dies by Air Pressure

420 ft. long and 50 ft. wide. One end of this, 150 ft. in length, is a one-story and basement structure that is occupied by the casting room. The remainder is two stories and basement and is used for various manufacturing departments, inspection and shipping rooms, and for office purposes, the offices occupying the first floor at the front of the building. The second building is 200 ft. long and 50 ft. wide, one story in height, and contains the brass foundry, mixing and metal storage departments. A railroad siding adjoins this building into which raw stock is taken directly from the cars. The buildings are of brick and steel construction. The windows are of factory ribbed glass and steel sash, and the floors are of concrete.

Metal is received in the metal storage room in the form of zinc, tin, copper and lead ingots, and

after being weighed on a Toledo automatic scale goes to the stock room. The various alloys are made of a composition to meet specifications. The metals are combined into alloys in a battery of six furnaces, each having a melting capacity of about 1000 lb., and arranged so that they can be gas or coal fired. One furnace has a power-driven mixer or mixing blade that revolves in the pot, being geared to a motor. The metal in the other furnace pots is stirred by hand while melting. The alloy is taken from the furnaces in small ladles and poured into water-cooled, cast-iron molds, where it is cast into ingots weighing from 8 to 10 lb., in which form it goes to the melting pots of the casting machines.

The ingots pass down chutes into sheet-metal shop barrels having a capacity of 700 to 800 lb. each.



In the Cleaning Room a Band Saw Is Employed for Cutting the Gates from the Castings



The Die Makers' Benches Are Located at Right Angles to the Side Walls, Thus Giving Much More Bench Space than a Continuous Bench along the Wall

Each barrel bears a permanent stencil number. Covers are placed on the barrels which are sealed and weighed and tagged, and a receipt is given for each barrel and its contents when the barrels are delivered to the casting department. Here the barrels are distributed to the machines and their contents are used as needed. This care in checking up the metal is due to its high value. To prevent the entrance of burglars the windows in the metal storage department are covered with bars of the type used in prisons.

Ingots are handled in the mixing and storing departments on elevating platform, hand-operated trucks. A monorail track connects the two buildings, and a hand hoist equipped with scales is provided for conveying the barrels containing the alloy ingots from the mixing to the casting department.

Separate gas-fired furnaces are used in the mixing department for remelting rejected castings.

Adjoining the melting department is the brass foundry used for making the bronze shells for bearings. This is equipped with eight pit furnaces and three Hawley-Schwartz melting furnaces. Molds are made on three Osborn jar-ramming molding machines. An overhead hand hoist is used for handling the pouring ladle. Gates are cut off the castings with a punch press and then they are cleaned in the Pangborn sand-blast barrel and the two ends are ground. A chemical laboratory is also located in the foundry building.

The casting department is equipped with 35 die-casting machines designed by the company and arranged in three rows extending the length of the room. With the exception of a battery of gravity



The Machining Department in Which the Castings Receive the Finishing Touches

flow machines the casting machines are of the latest improved power plunger type, the metal being forced into the die at a pressure of 1000 lb. per sq. in. by an air cylinder above the machine. Each machine is operated by two men, one of whom handles the valve that controls the air that forces the metal into the die, and the other takes the casting out of the die, the two together changing dies when required.

The casting room is entirely free from piping, all pipes for water, gas, air, and for taking away the products of combustion being carried beneath the floor with connections through openings in the floor under each machine. Products of combustion from the melting pots, which are a part of each machine, are removed by four 8-in. pipes that run the length of the casting department under the floor and terminate above the roof at the end of the building. The ventilating system provides a natural draft, and the casting room is free from smoke and gases at all times.

The castings go from the machines to one end of the casting room, where they are counted and are given a preliminary inspection. Then they are taken to an adjoining cleaning room where the gates and fins are cut off and they are sent to the machining department. The cleaning department is divided into three sections, one for lead, one for zinc, and one for babbitt alloys, so that scrap metal in the form of chips from each cleaning department is kept separate.

Bronze shells used in making bearings go from the brass foundry to the bronze babbitting room on the second floor, where they are lined with babbitt. The shells are first cleaned by being dipped in acid. Then they are dipped into solder pots, after which they are placed in fixtures in special babbitting machines. A nozzle cap is placed over the casting in the fixture and clamped in place, and the babbitt is poured into the mold formed by the shell, a lining of babbitt from 1/16 to 3/32 in. thick being cast on the inner surface of the bronze shell. The molten babbitt melts the coating of solder and causes the adhesion of the two metals. The babbitt, after being poured, is air cooled in the machines. One man operates a battery of four babbitting machines. After babbitting, the gates are cut off on a band saw and the bearings go to the machining room. Here the outside of the bearings is machined on special turret lathes, the work being held in place by pneumatic power, and other machines are provided for boring, face milling and making the oil grooves. After these operations the bearings go to the inspection and shop departments.

The die-making department is one of the largest and most important departments of the plant, owing to the large number of dies required, some of which, particularly those for magneto parts, are very complicated and require weeks to make. Accuracy is maintained within 0.001 in. and an allowance must be made for the shrinkage of the casting. Dies are designed in the engineering department on the first floor, and the drawings are sent to the die room which occupies a large part of the second floor. One section of this room is used for machine work for repairing parts of casting machines, and the other for making dies. Each die maker and his assistant have a bench 8 ft. long and 3 ft. wide, one side of the die room being occupied by these benches, which are placed 7 ft. apart at right angles to the side wall. Each bench is equipped with two drawers, one for the die maker and the other for his assistant. Dies are designed so that as many small parts as possible are cast in one die, and thus in one operation of the die-casting machine. One of the recent products is a washer about 3/4 in. in diameter made

in large quantities for a munition part. Sixty of these washers are made in one die, the casting coming from the machine with the washers attached to the leader through a thin surrounding web and gates. The washers are cleaned and cut from the attached metal on a punch press with a special fixture that cleans both the inside and outside circumference of the washer, 10 of the washers being cleaned with each operation of the press.

The air compressor equipment occupies a basement room. This includes a Bury two-stage 7 1/2 x 14 x 14-in. compressor, providing 150-lb. pressure for operating the air cylinders of the casting machines, a 14 x 14-in. Bury compressor supplying 60-lb. pressure for blowing dust from the dies between operations, and an American Air Compressor Works' 200-lb. pressure compressor that supplies the air for the machines that make die-cast bearings.

In the basement are also located the steel stockroom, the dieroom and the salvage department for bearings, where bearings rejected by the inspection department are again inspected and those having defects that can be corrected are reclaimed, a white metal inspection room, factory serve-self restaurant, a locker room with steel lockers, lavatories, and a shower bath room with 10 showers.

SHIPBUILDING AT MOBILE

Southern City Suddenly Becomes Important Manufacturing Center

MOBILE, ALA., Oct. 15.—Since the United States Steel Corporation recently purchased a site near Mobile for a great shipbuilding plant the importance of this city as a shipbuilding place has grown rapidly. For years Mobile has had several small plants that built small wooden vessels, principally motor boats, and one large concern, the Alabama Dry Dock & Shipbuilding Co., that has done work in steel ships, mostly repair work, but not until recently did shipbuilding attain a large position.

First recognition came from the navy department, which gave a newly formed concern, the Barret Shipbuilding Co., a contract for four submarine chasers. This contract was sublet to the Henderson Iron Works, which has almost completed the four vessels. This concern moved its plant across the river to Pinto Island, enlarged it and reincorporated under the name of the Henderson Shipbuilding Corporation. It is now actively launched in the shipbuilding business, with a capital of \$250,000.

Some time ago representatives of the Kelly-Atkinson Construction Co. of Chicago came to Mobile to see the agent of the Louisville & Nashville Railroad concerning rates on lumber and other materials necessary in the construction of ships. They were contemplating a ship yard at Pascagoula, Miss., 40 miles below Mobile. Upon suggestion they looked over sites in Mobile, were pleased with the old Heironymus Docks property, and entered into a two-years' lease for it. This company holds contracts for building 18 merchant vessels for the government, to be completed in 18 months, at a cost of \$10,000,000. It will build six marine ways and will erect machine shops costing \$50,000 on the property. The first keel was laid Sept. 15, and the work is rapidly progressing.

Through the Tennessee Coal, Iron & Railroad Co. the Steel Corporation has purchased 11,500 acres eight miles above Mobile, paying \$780,000 cash. This land is said to be for a shipbuilding site.

While the plans of the Steel Corporation for the development of its Mobile property have not been made public, it is generally understood that they include plants for the manufacture of nearly everything that goes into the composition of steel ships, except the plates. The plates will be rolled at the steel plant at Fairfield, near Birmingham, for which the Steel Cor-

position recently appropriated \$11,000,000. Twelve marine ways will probably be built and 12 ships fabricated at a time. It is understood that, in addition to these various mills and shops, the Steel Corporation will build a model city near the ship yard. So large a property as has been purchased would not be needed for a ship yard alone.

The Government has spent in the neighborhood of \$15,000,000 canalizing the Warrior River up to the Birmingham district, and it offers cheap all-year navigation to the products of that district. It is said that steel plates can be shipped by barge to Mobile for 40 cents a ton, against a rail rate of \$2.80 a ton.

Coal Distribution Order Issued

WASHINGTON, Oct. 16.—The first of a series of orders to distribute coal on a priority basis and regulate the movement of coal cars, issued by Fuel Administrator Garfield, provides that the Pennsylvania Railroad, which serves about 7000 mines, shall have its needs properly taken care of. Other railroads will be served through similar orders soon to follow, which will comprise the first series.

All producers of bituminous along the Pennsylvania lines will contribute pro rata to the fuel needed for its operation. The amounts required will, in some instances, interfere with delivery of full consignments called for by their contracts with customers. But the railroads must be kept running. The Fuel Administration suggests that operators withhold coal from persons or corporations needing it least, and that they attend particularly to the supply of other railroads than the Pennsylvania.

It is deemed particularly essential that coal needed by the United States Government be not interfered with. The Fuel Administration may make a special priority order in special cases and intends to care fully for domestic users. Munitions plants and firms manufacturing necessities of life would come into the priority order class. The plan is expected to show immediate results in an increased supply of coal cars and a steady, equitable flow of fuel to the railroads.

The tremendous increase in manufacturing and transportation activity this year has created a demand for soft coal in excess of any in the past, an increase in demand that is difficult to measure in terms of tons but that is certainly more than the 10 per cent by which production has increased. To meet this demand the mines have been producing soft coal at a rate never before equaled. In the second week of July, 1917, the average daily production was more than 1,900,000 tons, the highest point yet attained; in the middle of August, the lowest rate for the summer, 1,638,000 tons, was recorded; and in the last week in September the daily rate was 1,823,000 tons. In the first eight months of 1917, the output of soft coal was 363,500,000 tons, or 37,000,000 tons more than in the first eight months of 1916. In the same period shipments of anthracite increased 16 per cent over those of 1916.

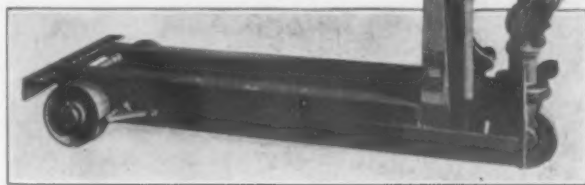
The Filer & Stowell Co., Milwaukee, manufacturer of machinery, engines, etc., has filed suit in the Circuit court at Milwaukee against fifty-two fire insurance companies, to recover sums aggregating \$352,373, claimed to be due upon its loss by fire on Dec. 15, 1916. The complainant states that it carried insurance to the amount of \$760,000 and that the fire damage amounted to \$896,296, and the amount of damages claimed is stated to be the difference between the sum of its policies and the payments thus far made by the companies on the loss.

Electric steel foundries and other large consumers of current in Milwaukee and immediate vicinity are confronted by a sharp increase in the cost of current by the action of the Railroad Commission of Wisconsin in granting the Milwaukee Electric Railway & Light Co. and other electric power companies an increase amounting to approximately 22 per cent in charges for current, effective immediately. The increase affects all consumers who use 1000 kw. or more per month.

A War Time Industrial Lift Truck

A form of high lift industrial elevating truck intended for light duty has been placed on the market by the Lewis-Shepard Co., 48 Binford Street, Boston. The maximum capacity of the truck is less than the earlier one, which was illustrated in THE IRON AGE, May 4, 1916, being 2500 lb. as compared with 5500 lb.

The load is lifted vertically by a combination of leverages secured by from four to six short strokes on the handle, and as the ratio is 40 to 1 it is emphasized that women and boys can operate the truck, thus releasing men for other work. A universal joint secures a free lifting and steering handle, which is a feature that permits the load to be elevated with the handle of the truck



A Lifting Ratio of 40 to 1 Enables Women and Boys to Operate This Truck

turned to the side. In this way it is possible to raise or lower a load in narrow aisles or other congested places. The load is lowered to the floor by a release check controlled by a pedal located on the front of the truck. Placing the check in a vertical position, it is pointed out, eliminates the probability of leakage at the piston end or the buckling of the plunger. The necessity of changing leather cup packing is also done away with as all the parts are of metal.

This truck is made in six models, three having wheels 6 in. in diameter, while those of the other three trucks are 10 in.

Automatic Oscillating Radial Grinding Machine

For grinding radial thrust bearings, large diameter spherical shapes, external and internal ball races and spherical sockets, the Rivett Lathe & Grinder Co., Boston, has brought out an automatic radial grinding machine. It can also be used for all classes of radial grinding work and has an adjustable cross feed for the workhead and a fixed rate of travel for the oscillating head throughout the latter's stroke in contradistinction to the general design of this class of machinery. It is pointed out that with the variable cross feed, which can be procured through a simple adjusting collar and is automatically decreased as the grinding proceeds, it is possible for the operator when starting work on a bearing race, for example, to remove the metal rapidly and take a fine cut while finishing. Greater uniformity in the work is said to be secured as a result of providing a fixed rate of travel for the oscillating head since the grinding wheel remains in contact with each portion of the finished surface for the same length of time.

Brass Flux to Reduce Silicates

In a paper presented before the American Institute of Metals at its annual meeting in Boston, E. D. Frohman, S. Obermayer Co., Pittsburgh, claimed for the Rillton brass cleaner, a flux made by that company, reduction of silicates of copper as well as oxides in the process of melting brass. He said that in one case a melt in an open-flame furnace contained considerable slag and in this case the addition of 2 to 3 lb. of the flux to the charge enabled the furnaceman to tap 530 lb. of metal, though the original charge of metal was only 500 lb. This he claimed resulted from the reduction of the non-ferrous silicates in the slag.

The Leather Belting Makers' Association

Operation of the Leather Belting Exchange Under Open-Price Competition and the Results Attained

—BY LOUIS W. ARNY*

THE Leather Belting Exchange is a trade organization composed of 37 manufacturers of leather belting, and representing 60 to 65 per cent of the leather belting product of the country. The efforts leading to its organization began in September, 1914, and the following months were devoted to a careful study of the conditions of the trade and of the methods which were in use by other trade organizations. For a number of years prior, the conditions in the leather belting trade were very bad. There were 160 concerns in the country competing for the business, many of them getting but a very small share, and most of them very ignorant about their own costs of production or their competitors' selling prices. Of the latter, the only information available was that gathered by salesmen from buyers and, as the buyer is always an interested party, this information was often incorrect and extremely unreliable, but as there was no other source it formed a basis for all the quotations which were made.

The Basis of Operation

The system in use by the Exchange is a composite, embodying the best practice and the best thought and the experience of other trade organizations, adapted to the peculiar conditions of the leather belting business, and, after an experience of nearly two years, has proved satisfactory. It is founded on the principles promulgated by Arthur J. Eddy of Chicago, and explained and elaborated in his book, "The New Competition." The fundamental principle is that of publicity, the supply of accurate information to members regarding sales which have been made. This information is derived from the seller, and not from the buyer, and passes through a routine by which it is audited, classified and tabulated, and then goes to the members. It was believed at the time of organization, in consonance with the Eddy theory, that when a seller had accurate and dependable information regarding the prices at which similar goods actually had been sold, his logical impulse would be to demand for his goods prices on a parity with those at which he knew that other houses had sold, or approximating thereto. This is the same principle which has worked successfully in the grain and stock exchanges. The prices at which belting has been sold are open and above board, and the Exchange is therefore an "open price association." In an organization of this character it is of first importance to secure the confidence of the members in the inviolability of the information which they impart to the Exchange, by establishing safeguards which will satisfy them that their business secrets will not be exposed.

Advantage of Meetings

A very important feature of trade association work is the meetings, the purpose being to bring the members together as frequently, and to get them into as close touch with each other, as possible, so that they may really know each other intimately; and this close personal touch is of the utmost importance. This is difficult in such an organization as the Leather Belting Exchange because the members are located at points so far distant, but an effort has been made to accommodate the meetings as far as possible to the convenience of the members. Annually there is one meeting arranged for a week end at a resort, and the members with the ladies of their families are together three days. Though this meeting is largely social, it is the most important meeting of the year in producing those relations among the members that take the sting out of competition. Men who spend three days with each other golfing, automobiling, walking, etc., and the members of whose families develop friendship for each

other look in a different light upon their competitive relations. All these meetings are reported stenographically and every member, whether present or absent, is in close touch with everything that has been said or done. They are held with open doors and any member is privileged to bring a non-member competitor, a buyer or a friend.

The Matter of Price Reporting

In the operation of the Leather Belting Exchange as regards the price at which its members sell their goods there is no compulsion, coercion or restriction, or even influence, implied, expressed, understood or intended, and every member is absolutely free to make any classes or grades of goods that may seem best to please his trade and to sell them to any buyer anywhere at any prices and terms that may seem suitable to him. It must be emphasized that the Exchange does not concern itself in any manner about prices to be made or quoted in the future and it makes no effort to control or influence prices, but concentrates its work on reporting prices which have been made on transactions which are completed, trusting entirely that the price question shall adjust itself through the logical results of the information concerning what has been done.

The only requirement of the Exchange is that, after the sale has been made, a duplicate copy of the invoice shall be forwarded to the office. At the meetings there is no discussion whatever of price, and lately there has been very little private discussion among the members, principally because they have all the data regarding prices, and there is little to be said on the subject, but any information that any member at any time may want about prices or quotations which have been made by member houses can always be had for the asking. When a salesman reports some fabulously low price from a buyer as having been quoted by a competitor the inquiry sometimes is made as to the accuracy of the statement, but usually for the purpose of exposing its falsity. Buyers are not so active in their efforts to break down prices by reporting fictitious quotations as they once were. Further, the price question is looked upon as having been settled in the automatic control exercised by publicity. In view of the high prices of material, prices for the product are not regarded as being satisfactory, but, considering all the factors of the case, they are probably as nearly satisfactory as reasonably can be expected.

Daily Charts to Members

In actual working, every member sends to the secretary every day a carbon copy of every sale of leather belting that he has made that day, this carbon copy being identical with the sales invoice, giving the name and address of the buyer, a description of the goods sold, the quantity, price, discounts, terms and weights, omitting only the name of the seller, but substituting for it a number, by which it is identified. The Exchange then assort these invoices and calculates from the data thereon the weight per square foot in ounces and the price per pound realized, and all these, excepting only the name and address of the buyer and the name of the seller, are reported on a chart which goes to every member every day. These sales cover the entire country and some little delay in the receipt of the invoices at the office is unavoidable, but this work is now so managed that the charts are just ten days behind the actual sales, so that the members are in possession on the eleventh day of the month of a full report of all the sales which were made on the first day of the month. The only exception is that the Exchange limits its publication on these charts to such items as amount to more than \$60, because there is a vast volume of these small sales which are unim-

*Secretary Leather Belting Exchange, Forrest Building, Philadelphia.

portant competitively, and their omission reduces the work of the Exchange and concentrates upon the charts only those items of most interest.

The leather belting product is divided into four grades or qualities, and on these charts each one of these grades is reported separately, and all the items of a similar grade are grouped under one heading. In addition to these reports of sales, the chart each day gives a summary, which supplies the following information:

1. The total sales of that day, including invoices of all amounts.
2. The total sales for the month to that day, inclusive.
3. The total sales to the same date, inclusive, of the previous month.
4. The average price per pound realized in all sales for each of the four grades mentioned.
5. Total average price per pound received for all classes of belting.

The country is divided into geographical districts, each of which embraces a number of States, and the disposition of the goods in these districts is indicated so that, though the members do not know the buyer or his address, they know that certain volumes of goods have gone into New England or the Middle West, and the trend of demand in these various geographical districts may be watched. Incidentally, the routine of the Exchange also supplies an additional audit on these invoices and it discovers many errors, some of them of considerable importance, which might otherwise remain uncorrected.

A Monthly Report to Members

In addition to the charts which go out every day, as described, the entire business for each month is tabulated and summarized in a monthly report, which is issued as soon as possible after the sales of the last day of the month are reported. These reports are made up separately for each individual member and they give the following information:

1. Total business done by all members of the exchange, and as compared with the total business of the previous month and of the corresponding month of the previous year, with the variations expressed in percentage.
2. The total business of the individual member addressed, and as compared with his total business of the previous month, and for the corresponding month of the previous year, with the variations expressed in percentage.
3. His proportion in percentage of the total business done by all the members, with a comparison of his similar proportion for the previous month and the corresponding month of the previous year.
4. The maximum average price obtained by any one member on each of the four grades of belting mentioned.
5. The minimum average price obtained by any one member on each of the four grades of belting mentioned.
6. The average price obtained by all members on each one of the four grades named.
7. The average price obtained by the individual member to whom the report is sent, and as compared with the average price obtained by him during the previous month and during the corresponding month of the previous year, with variations expressed in percentage.
8. The average price obtained by all members for all classes or grades of belting, and as compared with the previous month and the corresponding month of the previous year, with the variations expressed in percentage.

The monthly report also gives the average total sales per working day for the month and the total sales in each one of the nine geographical districts mentioned, and also gives the figures of the previous month and all other months for two years, so that the trend of volume of sales in each one of these districts is apparent.

What Results Have Been Attained

The information of the charts has been of much value in stimulating the sales departments to larger sales at good prices. It is a ready answer to the salesman who always complains that his prices are not right. It is also a check on the factory in the maintenance of goods to standards of weight, as any variation is quickly shown in the price per pound and, as a result, there has been a better standardization of weights, leading to closer uniformity in product. Without any agreement or understanding about prices, the possession of accurate information regarding the prices at which sales have been made by competitors has led

to a material reduction in the spread of the variation in prices, and making due allowance for the differences in the merit of the goods offered, and of the different methods and qualities of salesmanship employed, and of other conditions which enter into the problem of price, it fairly can be said that the system has accomplished results that may be considered as being highly satisfactory.

There have been at work, too, other forces besides those of information and possible emulation in the attainment of better prices, for the Exchange has constantly urged upon its members a betterment in the ethics of business. As a result of the higher ideals which it has tried to inculcate, there are to-day a number of houses who are selling their goods at fixed uniform prices for the same grades to the same class of customers everywhere, which has done much to unify prices. Formerly every price was the result of a haggle between the salesman and the buyer, but now, as a general rule, the more important concerns make prices that are beyond the power of the salesman to change or alter, and there are no special prices or considerations to be had. Further, the Exchange has labored toward the production of a more uniform high quality of goods, discouraging in every way any attempt at substitution, or of cheapening of qualities, and this in turn also has had its effect in unifying prices.

Standard Contract Form and Cost Accounting

The Exchange has adopted and put into practice a standard contract form, which is now being used by a large majority of the houses engaged in the business. This form reduces the length of time of the contract, obligates the buyer to take a specified quantity of goods within that time and limits the obligation of the seller to a stated amount, all of which are distinct improvements over the old form of contract agreement previously in force.

Another activity of the Exchange has been the development of a uniform system of cost accounting. This has been a work of much labor, because of the variation in the methods of the various members, but it has been accomplished and the Exchange's accountants are now at work installing this uniform system in the houses of the various members. The acceptance of this system is purely voluntary and there is no intention to make any use of it in any effort to control prices, but it is readily conceivable that when it is in full operation many members will learn that their production costs are quite different in some particulars from what they thought them, and it must have an indirect effect on the prices which, in the future, they may be willing to quote. It also must lead to the exposure of wasteful and inefficient methods and to the discovery and employment of better processes and to a better standardization of product. Members of the Exchange discuss with each other very freely their production problems, and welcome each other to an inspection of their plants, and the establishment of a uniform system of factory accounting will make it possible for them to discuss with each other these problems in terms which readily may be understood.

Scientific Research Undertaken

Another most important work which the Exchange has undertaken has been that of a scientific research into the nature and characteristics of its material, looking toward a betterment in the process of manufacture, and the production of a leather belt of greater efficiency, and possibly at a lower cost, and the development of real data on the subject of belt engineering. There is no satisfactory information on this subject, due to the fact that comparatively little work has been done upon it, and this little has been done by those who were not well informed regarding the nature of the material of which belting is made. It is the purpose of the Exchange to develop a standard belt of the greatest efficiency and economy, and to then formulate and classify the scientific principles under which this standard belt may be most successfully operated. This is a large work, involving much expenditure, but the Exchange has undertaken it with the purpose of placing the business on a higher plane than it has ever occupied.

Investigation of an Acid Open-Hearth Heat

Uniformity for Shell Steel Demonstrated for British Government—Ingot Mold Large End Up with a Hot Top

—BY T. D. MORGANS AND F. ROGERS

THE work described in the present paper was undertaken at the special request of Colonel Stansfeld, C.B., deputy director-general of munitions inspection, with a view to determining the general quality and uniformity of the acid open-hearth steel made at the Blaenavon Co.'s works for the manufacture of high explosive shells.

The plan of the investigation consisted in making the following analyses and tests from pit samples and from the top, middle, and bottom billet from one of the 40-ton acid open-hearth furnaces:

Analyses of pit samples taken immediately before casting each ingot (Table 1).

Analyses of the top, middle, and bottom billet from each ingot (Table 2).

Tensile test from the top, middle, and bottom billet from each ingot (Table 3).

Brinell test from the same (Table 3).

Microscopic examination of the same.

[The results of the tests are plotted in a diagram and a representative selection of photomicrographs are reproduced in the original paper.]

Experimental Heat

The following are the general particulars of the heat investigated:

Composition of the Charge

	Tons	Cwts.	Qrs.
Pig iron	19	1	0
Heavy scrap	21	8	0
Shell steel turnings	3	0	0
Ferromanganese	0	11	3
Ferrosilicon (50 per cent silicon)	0	2	1
Iron ore	2	0	0
Limestone, about	0	14	0
Total	46	17	0

	Hr.	Min.
Commenced charging	12	50 a.m.
Finished charging	6	0 a.m.
Charge melted	10	15 a.m.
Charge boiling	11	0 a.m.
Tapped	2	10 p.m.

Total time taken for charge, 13 hr. 20 min. The ferromanganese and ferrosilicon were put into the bath: none into the ladle.

Analysis of slag taken at the end of the process after the addition of the alloys:

	Per Cent
Silica (SiO_2)	55.67
Alumina (Al_2O_3)	4.11
Oxide of iron (FeO)	17.63
Lime (CaO)	10.04
Manganese oxide (MnO)	13.02
Sulphur and phosphorus (S and P)	Traces
Magnesia (MgO)	0.82

Color of slag, bottle-green.

Size of mold, 18½ in. by 16½ in. (top)

Size of mold, 16½ in. by 14 in. (bottom)

Top of mold brick lined to the depth of 11 in.

Total length of ingot, 5 ft. 6 in. (including head). Ingots teemed in pairs. Approximate weight of ingot, 40 cwt. The time taken to teem the whole cast was 25 min.

Slag was taken for analysis after the addition of the alloy and after teeming metal into ladle. The bath was caught coming down (no pigging back).

Ore not used after carbon in bath reached 0.70 per cent.

Analyses of Pit Samples

These figures will be readily appreciated upon reference to the mean, maximum, minimum and range of variation shown at the foot of Table 1. Practically the irregularities in carbon, phosphorus and silicon are negligible. The variations of sulphur and manganese are more noticeable, but on reference to the table, it will at once be seen that there has been a fairly general

fall of sulphur and manganese during the teeming of the ingots, a period of about 20 min. The fall of sulphur (0.009 per cent) is much lower, however, in relation to the fall of manganese (0.11 per cent) than would be the case if the removal of manganese sulphide were the sole action.

These, therefore, give very strong evidence that the fall in manganese is mainly due to the continuance of its deoxidizing action. The drop in sulphur and manganese in the ladle has occasionally been found by other observers.

Top, Middle, and Bottom Billet of each Ingot

The primary feature of the analyses of the top, middle and bottom of each ingot is their regularity. The variation of the sulphur no longer follows a definite

Table 1—Analyses of Pit Samples

Ingot	Carbon, Per Cent	Phosphorus, Per Cent	Sulphur, Per Cent	Manganese, Per Cent	Silicon, Per Cent
1	0.506	0.043	0.062	0.840	0.172
2	0.512	0.044	0.063	0.875	0.175
3	0.497	0.043	0.060	0.820	0.175
4	0.508	0.043	0.063	0.785	0.168
5	0.491	0.042	0.057	0.830	0.168
6	0.521	0.043	0.060	0.845	0.178
7	0.513	0.039	0.059	0.785	0.186
8	0.500	0.042	0.059	0.790	0.182
9	0.526	0.040	0.061	0.840	0.178
10	0.517	0.041	0.061	0.840	0.179
11	0.509	0.042	0.061	0.790	0.174
12	0.496	0.040	0.056	0.795	0.180
13	0.499	0.040	0.057	0.765	0.174
14	0.526	0.042	0.060	0.810	0.174
15	0.513	0.042	0.057	0.810	0.174
16	0.541	0.042	0.062	0.840	0.174
17	0.526	0.041	0.060	0.805	0.168
18	0.519	0.044	0.060	0.795	0.169
19	0.551	0.044	0.055	0.795	0.176
20	0.507	0.043	0.055	0.805	0.176
21	0.512	0.042	0.054	0.765	0.169
22	0.519	0.044	0.054	0.785	0.171
Maximum	0.551	0.044	0.063	0.875	0.182
Minimum	0.491	0.039	0.054	0.765	0.168
Range	0.060	0.005	0.009	0.110	0.014
Mean	0.514	0.042	0.059	0.810	0.175

fall. This is possibly because the ingot is drawn from a considerable part of the ladle, while naturally the pit sample can only represent a small fraction near to the nozzle at the moment of taking it. The agitation in the ladle during teeming the ingot would possibly be sufficient to mask the tendency evidenced only in the pit samples to removal of MnS.

Manganese in each case appears definitely to fall. The removal of manganese in the ladle may be taken as distinctly established throughout the present experiments and this is mainly due to the continuance of its deoxidizing action. In the bottom bars silicon also appears to have fallen, but we consider that an explanation founded upon this result might be rather hazardous. The mean results are assembled in the following table:

	Carbon, Per Cent	Phosphorus, Per Cent	Sulphur, Per Cent	Manganese, Per Cent	Silicon, Per Cent
Mean, top bars	0.542	0.045	0.058	0.840	0.177
Mean, middle bars	0.524	0.043	0.055	0.831	0.173
Mean, bottom bars	0.519	0.039	0.051	0.829	0.167
Range of means	0.023	0.006	0.007	0.011	0.010
Mean of means	0.528	0.042	0.055	0.833	0.172
Pit sample means	0.514	0.042	0.057	0.810	0.175

This shows distinctly the usual slightly higher percentages of elements found in the upper ends of ingots.

The comparison between the means of pit samples and of bar samples shows fair consistency in view of the much superior nature of the general sample constituted by the means from the bars, as compared with the mean pit sample.

It should be noted, as a rough generalization upon the whole of the analyses, that the range of variation

*From a paper presented at the annual meeting of the Iron and Steel Institute, London, Sept. 20.

Table 2—Analyses of 4-In. Billets—Finished Top Bars—Billet No. 7

Maximum	0.563	0.048	0.059	0.875	0.182
Minimum	0.525	0.043	0.055	0.785	0.175
Range	0.038	0.005	0.004	0.090	0.007
Mean	0.542	0.045	0.058	0.840	0.177

Finished Middle Bars—Bar No. 4

Maximum	0.541	0.045	0.058	0.845	0.175
Minimum	0.509	0.039	0.052	0.775	0.171
Range	0.032	0.006	0.006	0.070	0.004
Mean	0.524	0.043	0.055	0.831	0.173

Finished Bottom Bars—Bar No. 1

Maximum	0.536	0.042	0.054	0.865	0.173
Minimum	0.507	0.037	0.047	0.780	0.160
Range	0.029	0.005	0.007	0.085	0.013
Mean	0.519	0.039	0.051	0.829	0.167

in each element is of the order of one-tenth of the amount of the element present (that is, 5 per cent each way from the mean value), with the exception of silicon in the top and middle bars, which is less than this proportion, and carbon in all the bars, which varies only about 3 per cent up and down from the mean. The authors point out that this degree of variation com-

Table 3—Tensile and Brinell Hardness Tests on 4-In. Billets. Billet Position 1 (Bottom)

	Yield Stress, Tons per Sq. In.	Maximum Stress, Tons per Sq. In.	Elongation, Per Cent	Brinell Test on 3000 Kilos. Hardness Number
Average	23.15	46.82	21.94	208
Maximum	24.4	48.08	23.5	212
Minimum	22.4	46.2	20.5	201
Range	2.0	1.88	3.0	11

Billet Position 4 (Middle)

Average	23.01	47.12	21.5	210
Maximum	24.2	47.88	24.0	217
Minimum	22.0	46.0	18.5	207
Range	2.2	1.88	5.5	10

Billet Position 7 (Top)

Average	23.49	47.5	21.7	210
Maximum	24.6	48.6	23.0	217
Minimum	22.4	46.48	20.5	207
Range	2.2	2.12	2.5	10

Average yield stress of whole cast, 23.21 tons per sq. in.
Average maximum of whole cast, 47.15 tons per sq. in.
Average elongation of whole cast, 21.71 per cent.
Average Brinell hardness number, 209.0.
Ingots 3 and 4.—Electric power failed at roughing of Ingot 3, and bottom billet of Ingot 4 too cold to finish. Hence the omission of these tensile and hardness tests.

pares favorably with tests upon single casts which within their experience have been obtained in works practice and is closer than is usually obtained upon successive similar casts.

Tensile, Hardness and Forged Shell Tests

The tensile and hardness tests, in view of their practically featureless uniformity, call for very little comment. It is seen that the tests are well up to standards for this class of steel without further heat treatment after rolling to 4-in. square billets.

It has been possible to add some results of tests taken from the walls of the shell which were forged from this cast, Table 4.

It is seen that these results are well in accordance with the usual specifications for steel of this class; and they show the maintenance of that regularity in quality which was indicated in the more exhaustive tests upon the semi-finished steel already discussed.

Table 4—Tensile Tests on 4.5-in. Shell Forgings

Elastic Limit, Tons Per Sq. In.	Maximum Stress, Tons Per Sq. In.	Elongation, In 2 In. Per Cent
Over 19	48.1	21.6
Over 19	47.6	21.6

The illustration shows a photograph of a section of an ingot from another cast, A20, the particulars of the manufacture of which are practically identical with those of the experimental cast, all the ingots of which were rolled into billets. This ingot was teemed in 2½ min. Its weight was 1 ton 18 cwt. 0 qr. 18 lb.; and the weight of top discard was 4 cwt. 2 qr. 20 lb., which is 12.26 per cent of the total weight of the ingot. The following is the chemical analysis of this ingot:

Carbon Per Cent	Silicon Per Cent	Sulphur Per Cent	Phosphorus Per Cent	Manganese Per Cent
0.44	0.164	0.050	0.045	0.820

The tensile test from the same cast rolled to 4-in. billets was:

Elastic Limit, Tons Per Sq. In.	Maximum Stress, Tons Per Sq. In.	Elongation in 2 In. Per Cent
21.9	43.4	22

The pipe was very satisfactorily located in the head and its form indicated no tendency to secondary pipe.

Microstructure of the Steel

Photomicrographs were taken under comparative conditions from 17 of the billets at random. The position of the field photographed was in every case approximately upon the continuation of the axis of the tensile test piece and near one corner of the section of the billet, about ½ in. from each of the two neighboring sides. The magnification was 50 diameters.

The structure consists of a ferrite network, which is partially discontinuous in places, whose meshes are filled with generally lamellar pearlite. Toward the edges of the billet the network size is smaller, and toward the center larger than at the field adopted as standard for the photomicrographs. In many places



Section of An Acid Open-Hearth Steel Ingot Cast at the Plant of the Blaenavon Co. for Making High Explosive Shells. The effect of the hot top and casting large end up is revealed by the extent of the pipe

there are isolated large meshes, or local discontinuities of the network according to the point of view. Throughout the general microscopic examination of all the pieces, no features were encountered which could be classed as defects in a steel of this class.

The variations of structure which were found were such as ordinarily occur in good steel of this class. Such variations, including local differences of network size, were not in any instance of a nature which would prove detrimental to the steel for the purposes for which it was intended.

It is announced in Wheeling, W. Va., that a new company for the manufacture of airplanes will be organized there, of which A. P. Phillips, for a long time associated with the Curtiss plant in Buffalo, will be general manager. A plant will be established, but for the present this will be devoted only to the manufacture of airplane parts.

CASTING BEARINGS

Molding Practice—Segregation in High-Lead Alloys—Sand versus Metal Molds

FOUNDRY problems in the use of both sand and metal molds for casting bearings of nonferrous alloys were discussed by R. R. Clarke, Pennsylvania Lines West, Pittsburgh, in a paper presented at the annual meeting of the American Institute of Metals, Boston, Sept. 26. He explained some methods of avoiding difficulties commonly experienced in molding each of three groups of metals; those containing less than 10 per cent lead, those containing between 10 and 15 per cent lead, and those containing between 15 and 50 per cent lead. An abstract of his paper follows:

Low-lead alloys, if the phosphorus and the ratio of tin to copper are held to safe limits, offer no great difficulty. The 80-10-10 alloy with $\frac{1}{2}$ to 1 per cent phosphorus is easily handled. It works best on second melting, though satisfactory results are obtained by combining and pouring direct. We have found that adding the tin and lead in combination to the copper bath together with vigorous stirring improves the product.

In making the mold, the sand should be of good body and rather dry. Also, it should be tamped until hard, as this causes the metal to freeze rapidly. Facing the molds well with plumbago has the same effect and also makes for a smoother casting. The mold when of sufficient depth should be gated at or near the bottom and the metal should be poured at a low temperature, as hot metal favors lead segregation. Also, the castings should be left in the sand until cooled below the freezing point of lead. A horizontal molding position with the journal core in the drag is preferred, although molding castings such as crown brasses in a vertical position or "on end" is sometimes countenanced. It is a method we have tried and discarded.

Products of medium lead content require the same measures. Phosphorus should be kept to a mere trace, melting and pouring should be done from medium sized rather than large crucibles and stirring should be vigorous and from the bottom up.

Practice with high-lead alloys varies only in a few details from that of low-lead alloys. The inclusion of phosphorus is prohibitive, the use of low-grade material is more markedly detrimental, and the constant building up of scrap with new material is more imperative. Cope shrinkage also is more pronounced and calls for higher and more powerful pressure gates.

Castings of high-lead content should be shaken out cherry-red rather than left in the sand until cold, as this prevents excessive segregation. It is found that the metal casts as well using the direct method as by first pigging and then casting. When working new metal with scrap a good method is to first reduce the copper and then add the scrap, followed by the lead. High-lead alloys should not be subject to air and oil methods, at least not in the type of furnace we operate. Also it appears that the electric furnace is satisfactory. Regardless of practice, absolute exemption from segregation in high-lead alloys has not been our experience.

Metal and Sand Molds Compared

The chill-molding idea applies chiefly to the crown brass variety of work embodying heavy duplicate castings. Locomotive driving-box shells are an example. They run from 50 to 200 lb. and represent almost exclusively our experience in chill-molding bearing metals of copper base. With metals of low or conservative lead content we have not had much success. With higher percentages fairly satisfactory castings are possible, though we do not concede these castings to equal the sand-molded ones. They have a tendency to blow holes, shrinkage, and a most unsightly appearance. This latter condition arises from the lead sweating out and adhering in globules to the walls, these globules being broken off when the casting is removed from the mold. We also believe that the sand-molded castings

properly made are as free from metal-included sand as those molded by the chill method.

W. H. Wood 12 years ago developed an iron-chill mold which is still being used in the Altoona brass foundry of the Pennsylvania Railroad Co. and which apparently promotes homogeneity by preventing too rapid freezing. However, we doubt that it is more economical than the molding machine. Also, the work of using it is not congenial. With five chill molds to work with, I would rather make 20 sand castings than 15 chill ones.

Copper Miners Agree to Arbitrate

WASHINGTON, Oct. 16.—The following telegram has been received from the commission appointed by the President to investigate the labor situation in the mountain region and on the Pacific coast:

"The President's labor commission, sent to the southwest and the mountain region, has concluded the hearing of the side of the striking miners in the Globe Miami copper district of Arizona. The commission was gratified to hear that the State leader of the strikers and President Moyer of the International Union of Mine, Mill and Smelter Workers have unreservedly placed the adjustment of the Arizona labor difficulties into the hands of the commission with an unconditioned agreement to abide by any decision the commission may make for the maintenance of peaceful labor relations in Arizona at least during the period of the war.

"The commission is now hearing the side of the operators and when that side is concluded and the views of other parties interested in the commission's inquiry are submitted the commission will begin the task of formulating a plan of settlement through the co-operation of all interested parties, which it is hoped will satisfy all sides and thus give the nation the copper it needs under just conditions of employment.

"The striking unions concluded the presentation of their case to the commission by making an unqualified offer to go back to work immediately upon the agreement of the operators to submit the dispute to arbitration by the commission, and to continue at work pending the arbitration. The strikers expressly stated that they were eager to do away with any delay which would in the least hold up the normal production of copper for the use of the nation."

The commission is composed of the following: William B. Wilson, Secretary of Labor, Col. J. L. Spangler of Pennsylvania, Verner Z. Reed of Colorado, John H. Walker of Illinois and E. P. Marsh of Washington. Felix Frankfurter of New York is acting as secretary of the commission.

Equipment for Tennessee Company's New Plant

A large order for the complete electrical equipment for the new plant of the Tennessee Coal, Iron & Railroad Co. at Fairfield, Ala., has been placed with the General Electric Co. This includes one type I-88, 4000 hp., 82 r.p.m., 6600 volt, mill type motor with fly wheel for driving the 110 x 36 in. plate mill; one type I-88, 2500 hp., 82 r.p.m., 6600 volt, mill type motor for driving a 28-in. roughing mill; one type I-50, 3000 hp., 155-130 r.p.m., 6600 volt, mill type motor with speed regulating set for driving 24 and 26-in. finishing mills; one motor set consisting of two type MCF-22, 2800 hp., 55 r.p.m., 900 volt, motors forming a 5600 hp. unit, with flywheel set consisting of three MCF-16 2000 kw., 360 r.p.m., generators driven by one type I-20, 4000 hp., 360 r.p.m., 6600 volt induction motor with 100,000-lb. fly wheel, for driving the 44-in. blooming mill. The order also includes all the accessories, switchboard and control equipment.

Atlantic furnace of the Republic Iron & Steel Co. at New Castle, Pa., has resumed blast after being relined and some new equipment added. The capacity of the furnace will now be about 400 tons per day. Hannah furnace of the company at Youngstown, Ohio, will likely be blown out in a short time for relining and general repairs.

TROUBLES RECLAIMING BRASS

Fluxes and Design of Furnace Were Obstacles to Remelting Scrap

Troubles incident to the installation and operation of a reclamation plant to reclaim non-ferrous metal scrap were described by W. H. Parry, National Meter Co., Brooklyn, N. Y., in a paper presented before the American Institute of Metals at its annual meeting in Boston. The ingots obtained from this scrap, he explained, were used in the making of red-brass castings capable of withstanding a pressure of 250 lb. per sq. in. A review of his paper follows:

A coal-fired reverberatory furnace with a capacity of 3000 lb. per charge was chosen after considering various types of furnaces and cupolas. The contract for building this furnace was let to a furnace builder specializing in the type of furnace desired, though a few alterations were made to his design by the company's engineers against his protest.

After a fire had been started in the furnace for the purpose of drying it, the cast-iron buckstays with which the furnace was liberally braced gave way under transverse stress. These gray-iron buckstays were replaced by those made of the garden variety of steel railroad tracks and no further trouble was experienced from them.

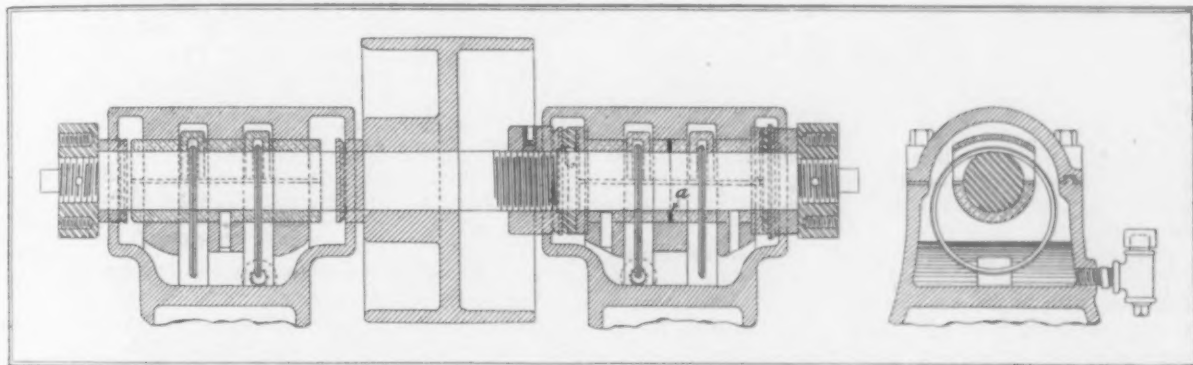
metal. As the flux weighed 900 lb. to a 3000 lb. charge it was expected that the melting loss would be very small, but again all metal was lost.

Combine one part of fluorspar, three parts of lime and one-half part of hard coal. This formula proved entirely unsuccessful.

The material melted and on which these fluxes were used was composed of spillings, turnings, slag, which had first been passed through a cinder crushing machine, band-saw dust and grindings. The latter was of a consistency similar to that of No. 2 Albany molding sand, and one-third of it was mixed with the charge.

New Spindle for Disk Grinding Machines

Providing clearance space to take up expansion in the bearing receiving the end thrust and the use of a special arrangement of oil channels in the faces of the thrust bearings characterize a new spindle construction that has been adopted on all single-spindle disk grinding machines built by Charles H. Besly & Co., Beloit, Wis. The clearance space is designed to take up any expansion in the phosphor bronze bearing bushing which receives the end thrust that may be caused by a rise in temperature while the bearing is in service. This has been made necessary by the fact that all of the end play must be taken up in both directions. The oil channels in the faces of the thrust bearings are of



Clearance Space *a* to Take Care of Any Expansion of the Phosphor Bronze Bushing Due to Temperature Rise in Service Is Provided in a New Type of Spindle Construction for Disk Grinding Machines

The fire box was equipped with 1½ in. square steel-grate bars. An air space of 1½ in. was allowed between bars. As soft coal was used this allowed about 75 per cent of the coal to drop down into the ash pit. These were replaced by cast-iron bars designed for an air space of ¾ in.

The most important error was reducing the stack area, making it impossible to do any more than fuse the metal. The return flue passing over the roof had an area of 240 sq. in., while the stack was squeezed to 113 sq. in. This was detrimental to the operation of the furnace, indicating that data bearing on steam boiler practice are not applicable to melting furnaces. A new stack was erected with a 340 sq. in. area and the height increased 10 ft. making the total distance above the flue 40 ft.

From various sources, formulas of fluxes were obtained, but these failed in practice. Technically trained experts with practical experience were consulted and more formulas were prescribed but these also failed. The furnace therefore was shut down until a man capable of operating it was found. He ignored all flux formulas and successfully melted all the metal.

A list of the flux formulas tried out and found inadequate follows:

To every 1000 lb. of metal add 150 lb. of air-slaked lime and 150 lb. of pulverized charcoal. Mix these dry. By the use of this flux all metal was lost.

To every 100 lb. of metal use a flux made as follows: Two parts of plaster of Paris, one part of air-slaked lime and one part of fluorspar. Mix dry and use a quantity not exceeding 10 per cent of the charge. By the use of this flux 80 per cent of the metal was lost.

Use three parts of lime, one part of silica sand and one-half part of anthracite coal to every 1500 lb. of

a special design which, it is explained, produces a pumping action that is relied upon to force the oil in large quantities between the thrust collars.

The bearings are a combination automatic ring oiling radial and thrust arrangement with inserted renewable phosphor bronze bushings. The supply of lubricant is placed in the cup shown at the extreme right of the accompanying drawing at intervals of 3 to 12 months, depending upon the character of the service to which the machine is subjected. From this cup the oil passes into the reservoir in the base of the bearing and is lifted by steel oil rings, two for each bearing. The rings operate through channels cut in the bushings, an arrangement which is relied upon to prevent the rings from failing to perform their functions due to displacement. In addition to the ring oiling arrangement for the radial bearings, channels are cut in the faces of the thrust bearings. These are of a special design which is relied upon to set up a pumping action and force oil between the thrust collars.

The bushings employed are of the inserted split type and can be renewed when necessary. The bushing receiving the end thrust is provided with a clearance space *a* which is relied upon to compensate for any expansion that may take place in operation. In this way, it is pointed out, all the end play can be taken up in the spindle without causing the bearing to bind between the hardened and ground tool steel thrust collars. These collars, which take up the end thrust, bear against the flanged ends of the right-hand bearing bushing. An adjusting collar, threaded on the spindle and located under the rim of the spindle pulley, is provided for taking up end play. In this way, it is pointed out, the accuracy of the work that is being turned out is insured.

Exports of Iron and Steel Increase

Reduction Attributed to Embargo Proves Temporary but Movement Is Still Below That of a Year Ago—Heavy Imports of Manganese Ore

THE embargo instituted by the United States Exports Council July 15 for a time cut heavily into the exportations of iron and steel as indicated by the July report of the Bureau of Foreign and Domestic Commerce, but a decided change is shown in the August

Exports of Iron and Steel

	August		Eight Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Pig iron	60,264	.....	283,382	.....
Ferromanganese	.....	a 453	.....	a 1,082
Ferrosilicon	.....	a 1,141	.....	a 3,206
All other pig iron	.....	a 60,489	.....	a 90,161
Scrap	18,149	6,761	121,833	134,784
Bar iron	.....	5,207	52,245	36,462
Wire rods	11,451	20,577	107,584	99,681
Steel bars	79,338	48,810	524,584	423,201
Billets, ingots and blooms, n.e.s.	160,921	189,083	888,565	1,329,708
Bolts and nuts	2,653	2,736	19,351	202,835
Hoops and bands	3,649	4,685	29,590	36,616
Horseshoes	372	1,495	6,206	3,112
Cut nails	.....	453	2,795	2,416
Wire nails	14,809	10,552	99,341	64,444
Wood screws	.....	a 129	.....	a 586
All other nails, including tacks	1,160	874	6,078	13,021
Cast-iron pipes and fittings	6,348	5,775	42,373	47,893
Wrought pipes and fittings	22,454	10,862	93,514	85,571
Radiators and cast-iron house heating boilers	434	188	1,632	4,017
Railroad spikes	1,366	843	18,561	12,808
Steel rails	41,820	24,698	304,773	338,592
Galvanized iron sheets and plates	8,527	7,822	55,123	57,976
All other iron sheets and plates	4,909	5,738	31,436	39,375
Steel plates	26,297	49,802	172,109	355,191
Steel sheets	8,536	11,576	68,110	93,628
Ship and tank plates, punched and shaped	.....	a 1,627	.....	a 3,044
Structural iron and steel	27,581	19,418	182,533	201,312
Tin and terne plates	18,758	15,962	160,357	116,460
Barb wire	46,843	8,817	299,515	109,915
All other wire	26,068	12,138	188,203	129,056
Total	598,192	522,810	3,714,426	4,036,456

a Not separately enumerated prior to July 1, 1917.

eight months the imports of manganese ore were 457,878 tons in 1917, compared with 395,686 tons in 1916.

Imports of Iron and Steel

	August		Eight Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Ferromanganese	8,525	2,840	48,687	35,473
Ferrosilicon	479	654	4,521	6,887
All other pig iron	5,882	2,296	28,857	12,749
Scrap	7,143	11,213	41,432	161,789
Bar iron	952	402	5,792	1,905
Structural iron and steel	55	1,063	1,067	2,745
Steel billets without alloys	105	5,615	8,135	25,905
All other steel billets	1,411	661	10,418	4,908
Steel rails	7,056	1,174	23,576	5,495
Sheets and plates	122	92	1,217	1,192
Tin and terne plates	105	.....	775	124
Wire rods	423	111	2,989	313
Total	32,258	26,121	177,466	259,485

report. The total of exports of iron and steel in July was only 349,649 tons, while for August it was 522,810 tons. The movement is, however, still below that of a year ago, for in August, 1916, the tonnage of exports amounted to 598,192. Decided gains were made in August in the exports of pig iron, scrap, billets, rails and plates. In the valuation of machinery exported, the total shows a heavy decline as compared with a year ago, but the amount is almost the same as for July of this year.

The imports of iron and steel for August amounted to 26,121 tons compared with 32,258 tons in August, 1916, and with 28,859 tons in July, 1917. The imports of manganese ore were 87,650 tons in August, 1917, compared with 76,721 tons in August, 1916. For the

Exports of Machinery

	August		Eight Months	
	1916	1917	1916	1917
Adding machines	\$129,067	\$153,806	\$956,869	\$1,492,402
Air-compressing machinery	131,690	56,916	513,555	648,457
Brewers' machinery	43	22,738	11,325	95,096
Cash registers	299,288	32,197	1,171,109	619,090
Parts of	16,176	5,208	103,710	57,135
Concrete mixers	.....	a 9,479	.....	a 23,844
Cotton gins	21,922	5,402	61,266	64,429
Cream separators	25,499	25,640	346,362	456,093
Elevators and elevator machinery	180,405	82,869	1,128,769	1,400,804
Electric locomotives	.....	2,253	377,042	322,305
Gas engines, stationary	36,783	20,223	248,729	579,164
Gasoline engines	2,031,934	212,218	11,256,199	2,398,925
Kerosene engines	.....	a 198,298	.....	a 406,405
Steam engines	1,821,236	2,564,329	7,518,864	17,952,107
All other engines	345,943	112,054	3,454,630	3,047,173
Parts of	1,235,185	.....	6,311,024	b 9,287,245
Boilers	.....	a 294,890	.....	a 506,644
Boiler tubes	.....	a 557,839	.....	a 1,039,377
All other parts of engines	.....	a 1,767,909	.....	a 2,634,859
Excavating machinery	.....	a 58,369	.....	a 85,052
Milling machinery, flour and grist	183,862	39,671	1,698,545	521,354
Laundry machinery, power	41,497	25,967	212,405	294,059
All other	26,804	31,548	146,461	175,268
Lawn mowers	23,412	7,121	170,719	144,747
Metal-working machinery (including metal-working tools)	8,134,473	.....	55,316,874	b 44,604,259
Lathes	.....	a 1,621,168	.....	a 3,181,002
Other machine tools	.....	a 785,685	.....	a 1,555,120
Sharpening and grinding machines	.....	a 406,670	.....	a 848,712
All other metal-working machinery	.....	a 1,771,683	.....	a 3,701,011
Meters, gas and water	66,079	26,270	271,071	323,351
Mining machinery, oil-well	316,911	95,212	1,439,620	891,059
All other	750,076	946,613	4,269,737	7,306,583
Paper mill machinery	108,514	199,259	525,985	1,282,690
Printing presses	207,375	208,833	1,260,043	1,134,272
Pumps and pumping machinery	527,970	463,667	3,523,658	3,977,294
Refrigerating and ice-making machinery	64,177	114,857	483,939	775,482
Road-making machinery	.....	a 22,118	.....	a 52,169
Sewing machines	391,980	444,460	3,744,281	5,068,193
Shoe machinery	82,524	87,196	666,450	1,011,202
Sugar-mill machinery	1,074,104	702,831	3,028,172	4,536,450
Textile machinery	394,224	283,456	2,389,367	2,181,841
Typesetting machines	54,649	92,394	792,551	778,676
Typewriting machines	1,438,199	527,086	7,327,448	6,706,204
Windmills	83,046	* 78,123	761,798	715,531
Wood-working machinery, saw mill	46,688	61,178	290,715	411,164
All other	125,569	58,331	608,733	711,894
All other machinery, and parts of	4,104,910	2,912,441	25,663,807	26,971,292
Total	\$24,657,597	\$18,196,475	\$148,061,832	\$162,977,581

a Not separately enumerated prior to July 1, 1917.

b Six months ending June 30, 1917.

A DOUBLE ANNIVERSARY

Taylor-Wharton Co. Celebrates Its Founding and the Making of Manganese Steel

VERY few steel companies are able to celebrate their 175th anniversary and still fewer can probably combine with such an event the commemoration of a 25th anniversary, pointing back to a distinct land mark. It was the good fortune of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., to be able to do both of these unusual things on Saturday, Oct. 13. It was also possible for the company to capitalize the fact that it has furnished iron or steel for every war in which the United States has ever taken part.

Cannon balls of iron and other war necessities were manufactured by the Taylor Iron Co., founded in 1742, for the Revolutionary war. Twenty-five years ago, in 1892, the company started the manufacture of manganese steel castings which has been a very important part of its output ever since. These two facts furnished the basis for the celebration.

The Taylor-Wharton Iron & Steel Co. of to-day had its start in early Colonial times. The High Bridge, N. J., district in early times possessed local ore deposits, abundant timber for charcoal and plenty of water power and these induced the original founders to locate there. They employed Robert Taylor to manage the work for them. Shoes for horses and oxen, wagon iron, nails and crude farming implements and necessities were made in the early days. Later material was furnished for the Revolutionary war and the Civil war. While there have been periods of inactivity in the long lapse of years, due to business depressions, there has been none in the last 50 years. During the entire history of the company, since the management by Robert Taylor, the leadership has continued through five generations in direct line of descent.

Manganese Steel and Recent Expansion

In 1892 came the greatest change in the company's history, unless its recent expansion by the purchase of new companies be recognized. In that year came the introduction of the manufacture of alloy steels or manganese steel, under the direction of William J. Taylor, assisted especially by Dr. Henry M. Howe, Oliver W. Chrystie and Henry D. Hibbard, with the co-operation of Sir Robert Hadfield of Sheffield, England. Lewis H. Taylor was then president. The High Bridge plant, with 256,000 sq. ft. under roof, is now devoted entirely to this industry, turning out many kinds of manganese steel castings for mining, dredging and other work. The output is now over 60 tons of converter steel castings a day from a 3-ton converter. A Heroult electric furnace will soon be operating, supplementing the converter process. Besides the dredging buckets and large and small gears and pinions the company produces a special line of manganese steel chain made up of assembled steel castings.

With the introduction of the manufacture of manganese steel, the company's name was changed to the Taylor Iron & Steel Co. and its manganese steel has since been known by the trade name Tisco. In 1912 the company purchased the plant of William Wharton, Jr., & Co., Inc., Philadelphia, for the purpose of expanding the use of manganese steel in track work. The Wharton company had become the largest customer through an exclusive arrangement which had existed for 18 years. Since then the parent company has further expanded until it controls five main subsidiary plants as follows:

The High Bridge plant, operated directly under the name of Taylor-Wharton Iron & Steel Co., originally the Taylor Iron & Steel Co., is devoted entirely to the manufacture of manganese steel and other special steel castings. This was the first, and for many years the exclusive producer of manganese steel in this country.

The Easton, Pa., plant, operated in the name of the Wm. Wharton, Jr., & Co., Inc., is entirely new, consolidating three plants formerly located in Philadelphia. The product is track work, such as frogs, switches, curves and track layout for

steam and electric railroads and all kinds of light and heavy iron and steel forgings and castings. A considerable portion of the manganese steel castings made at High Bridge is used in the manufacture of track work at the Easton plant.

Philadelphia Roll & Machine Co. now consists of two parts, the Twenty-third Street plant making rolls and rolling mill machinery, and the Twenty-fifth Street plant, formerly the property occupied by the Wm. Wharton, Jr., & Co., which produces iron and steel castings and machinery of a miscellaneous nature.

Manganese Steel Safe Co., Plainfield, N. J. Preparations are being made for the removal of the machinery and business of this plant to High Bridge.

Tioga Steel & Iron Co., Philadelphia, produces light and heavy miscellaneous hammered and hydraulically pressed forgings. Recently this company has been awarded a contract by the Bureau of Ordnance, United States Navy, covering a heavy tonnage of rough machined and heat treated forgings for 4-in. Navy guns, for which a new plant is being built.

The Historical Pageant

The little town of High Bridge was gaily decorated on Saturday where visitors and guests from nearby towns and steel men from New York, Philadelphia, and other places assembled at the invitation of the company. With the population of the town at least 9000



Colonial Float Drawn by 10 Horses Showing the Part the Taylors Have Taken in the Manufacture of Munitions for Their Country's Various Wars

persons attended the anniversary. Plant visitation formed an important part of the program, various groups being escorted through the works by specially designated guides. The feature of the occasion was a historical pageant or parade which, after passing through the principal streets of the town, was reviewed by Knox Taylor, president of the company, and other officials and guests from a reviewing stand in front of the company's main office.

The parade was an imposing spectacle, made up of many floats representing the local civic industries and fraternal societies as well as the development of the company with special ones from each unit of the company. The Easton plant was represented by many employees and the Philadelphia units were well represented, escorted by a Philadelphia band of 20 pieces which swelled the music from four other bands. Of special interest was an automobile carrying the men who have been in the company's employ for 50 years or more; a Colonial wagon with six horses carrying the 40-year men with other 40-year men in decorated autos, and three automobiles carrying representatives of three generations now employed at the steel plant.

Gold medals were given to employees who have been 50 years with the company, silver medals to those who have been in service 25 to 50 years, and bronze medals to those from 5 to 25 years. A clam bake for 2500 guests was a feature as well as moving pictures and dancing in the evening.

Dr. Henry M. Howe and Henry D. Hibbard, pioneers in the business, were present and were among those scheduled to deliver addresses late in the day, as well as Governor Edge. The celebration was impressive in that it demonstrated the unanimity which pervades the entire organization and which has been so instrumental in its success in the past.

THE MANGANESE PROBLEM

War Minerals Meeting of the Mining Engineers Discusses Its Solution

A HIGH note of patriotism was sounded at the war minerals meeting of the American Institute of Mining Engineers at St. Louis, Oct. 8 to 11. The sessions opened with a patriotic gathering which was international in character. Doctor Ami, official representative of the British Embassy, spoke of Great Britain's appreciation of the entrance of the United States into the war and the efforts which were being made. He likened Great Britain, France and the United States, the three greatest world democracies, to granite made up of quartz, mica and feldspar. The three principal minerals of this most durable of all rocks, he said, typified the three allied nations, quartz standing for rugged England; mica for polished France, and feldspar, useful and complex in composition, suggesting the melting pot of the United States.

Captain De Billy, representing the French Mission and himself a mining engineer, talked on the work of engineers and particularly the mining engineers in the conduct of the war, not only on the firing line but behind the lines. Dr. Feodor Foss of the Russian Industrial Mission told how the mining engineers of Old Russia offered their services to the Government at the outbreak of the war but were refused. He stated that New Russia looked to the United States for assistance in solving her tremendous industrial problems.

F. W. De Wolf, assistant director U. S. Bureau of Mines, in charge of war problems, described in general the machinery of Government that has been designed and built by the co-operative efforts of the existing bureaus with business and professional men. He called attention to the fact that the business of Government had increased four fold since last April and while mistakes were necessarily made at first, order was gradually appearing; certain boards and committees have been found unnecessary and have been eliminated while those whose functions have been clear cut have acquired increased strength.

Work of the War Minerals Committee

The War Minerals Committee consisting of W. Y. Westuvelt, chairman, representing the American Institute of Mining Engineers; David White, representing the U. S. Geological Survey; A. G. White, representing the U. S. Bureau of Mines, and W. O. Hotchkiss of the American Association of State Geologists then outlined the purposes of the committee and the work which it was endeavoring to do. The entire audience showed a grim spirit of quiet determination but was moved to the greatest enthusiasm by the patriotic utterances of the speakers. It was not simply spontaneous enthusiasm because the speakers impressed upon those present the responsibilities upon the mining engineers of the country, while members of the War Minerals Committee brought home in a business-like manner the serious shortage of certain minerals essential in making war which results from the extreme lack of ocean shipping.

Shortage of Manganese and Pyrites

At the present time while there is a shortage of domestic manganese ore, there is also a shortage of pyrite, chromite, platinum, mica and other minerals, but the most serious of these is manganese and pyrite.

It was brought out in the meetings that the United States must endeavor properly to solve the problems of producing satisfactory domestic materials to replace those usually imported. In this way more ships will be available for the most effective purpose to which they can now be put.

The Work in Hand

Of greatest importance to the steel industry is the subject of manganese. In the past almost all of this, whether as ore or alloy, has been imported. The domestic industry has lain dormant. The War Minerals

Committee has been endeavoring to obtain the details of local deposits which are in the files of members of the profession. The U. S. Geological Survey has been actively engaged in obtaining accurate field data along these lines. The problem is not only one of the stimulation of production but the solving of problems of utilizing for steel making the various types of material which can be produced in the country. This work is being actively undertaken by the U. S. Bureau of Mines.

The War Minerals Committee urgently called for the time of individual mining engineers to be devoted, as a patriotic service, to the stimulation of production of domestic manganese ores, through a study of the possibility of improving present mining and beneficiation practice. A whole-hearted response was obtained from the mining profession to this request.

It was, however, pointed out that it would also be necessary for the steel industry to co-operate along the lines of investigating the possibility of using our domestic supplies. This will necessarily involve certain adjustments of the practice of using manganese in steel manufacture. It was hoped by the War Minerals Committee that, when the steel industry or consumers of manganese ore realized the seriousness of the situation, they would respond with a like spirit of patriotism and assist in every way possible the solution of the problems of proper utilization.

INVESTIGATING COAST STRIKE

Government Board Opens Inquiry—Shipbuilding Trouble Ends

SEATTLE, Oct. 12.—The metal trades strike, called more than a week ago, continues unsettled. The Federal Labor Adjustment Board has opened its inquiry in Seattle. While it is not believed that the board will render a decision in Seattle, it is considered likely that a temporary working agreement may be brought about that will permit the 9000 metal trades workers to return to work, pending a permanent adjustment. The strike condition is practically unchanged since the walk-out, with the exception of several small plants which have signed up with the union. The Skinner & Eddy Shipbuilding Co. is the only steel shipbuilding plant in the city that is operating. Practically all of the boiler plants, engine works and foundries are idle.

The one important improvement in the condition is the calling off of the strike of the wooden shipbuilders, by voting to return to work. This removes the 10-hour lumber issue entirely from the shipyard controversy and leaves the wage adjustment board a free hand in its efforts to bring about a settlement of the steel shipyard strike. The wooden shipyard strike has been in force since Sept. 14, and has been one of the most serious and difficult phases of the situation. About 1500 men will be affected by the new move. It is not expected that the action of the wooden shipbuilders will have any direct effect on the metal trades workers.

The shipbuilding strike in Portland has developed into a deadlock between employees and employers, over the open-shop issue. Portland plants have announced that they will leave adjustment of the matter to the Federal Labor Adjustment Board. Records show that 78 Government vessels are contracted for in Oregon. Some of the larger plants in Portland are working partial crews.

The Coughlan Shipyards, the Vulcan Iron Works and the Patterson Engine Works, all of Vancouver, B. C., are tied up by striking boilermakers and metal trades workers. Higher wages constitute the main part of their demands.

It is stated that an easier tone is felt in lumber and that sawmill production continues three-fourths of normal. The car shortage has again become a serious factor in western Oregon. West Coast lumbermen have been asked to furnish the Government with 10,000,000 ft. of fir airplane stock, 9,000,000 ft. to be clean and without a knot. It is stated that the spruce output is insufficient to meet the demands of the air-

plane manufacturers. West coast lumbermen are now engaged in turning out 25,000,000 ft. of fir stock for the Italian Government. Approximately 5,000,000 ft. of spruce is being shipped to the Government monthly from Washington mills.

New Sheet Plant Starts

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, has started operating its new six-mill plant, work on which was started November, 1916. The new plant will employ approximately 1300 men and will have an output of approximately 7000 tons per month. Two parallel buildings with standard lean-tos, measurements over all being 530 ft. by 225 ft., have been erected on an 18-acre tract of land. This work was done by the Massillon Bridge & Structural Co., Massillon, Ohio. One building contains the six hot mills, the four roughing mills, and the bar department. The other contains the cold-roll and finishing departments.

The hot-mill housings weigh 17 tons, and the mills are 30 in. in diameter, with 24-in. necks. The hot mills are driven by one 1500-hp. motor, furnished by the Westinghouse Electric & Mfg. Co., East Pittsburgh, and are gear driven. The driving gear was furnished by the Mesta Machine Co., Pittsburgh. The weight of the gears and flywheels is approximately 370,000 lb. The hot and cold-mill equipment, together with one roll lathe and four 156-in. shears, was furnished by the Hyde Park Foundry & Machine Co., Hyde Park, Pa. All mills are equipped with Baird water-cooled standing plates, which consist of hollow square plates, through which cold water runs. A cold-air system also has been installed on each mill. Fresh air is taken from the outside and kept circulating in the interior of the mill.

The plant is equipped with Allis continuous pair furnaces. The bars are charged from the rear of the furnaces and pushed to the front by hydraulic pressure. These furnaces were installed by the George J. Hagan Co., Pittsburgh. The sheet furnaces are of the standard two-door type, and for the present will be gas fired. Two motor-driven crocodile shears have been installed for cutting sheet bars. These were furnished by the Youngstown Foundry & Machine Co., Youngstown, Ohio. Three cranes, two of 25 tons and one of 30 tons, were furnished by the Alliance Machine Co., Alliance, Ohio, two being used in the finishing department and one in the hot-mill department.

The finishing department is equipped with eight cold mills, driven by one 500-hp. Westinghouse motor and Falk gears. The drive was designed by the Falk Co., Milwaukee, Wis. Five standard construction double annealing furnaces, capable of taking ten charges a day, were erected, and are hand fired for the present. The pickling department has two four-arm Mesta heavy-type picklers, this being the only department where steam is used. A 300-boiler hp. Stirling boiler equipped with Combustion Engineering Corporation stokers also has been installed.

Government Building Ships at Balboa

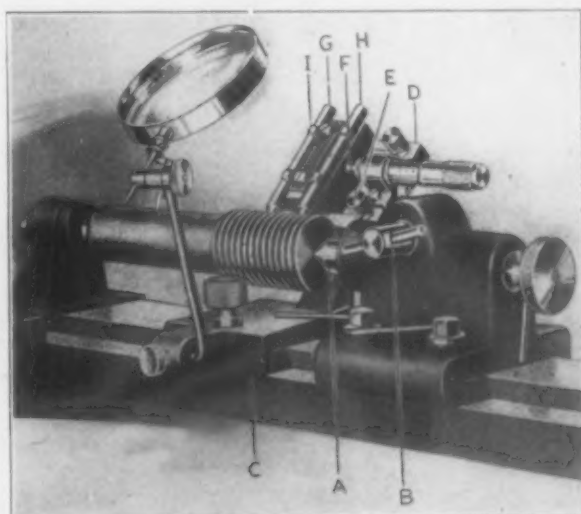
A coast guard cutter for the United States Coast Guard Service is being constructed at the Balboa shops, Panama. The hull dimensions will be: Length over all, 120 ft. 3 in.; beam, molded, 24 ft.; depth at side, 13 ft. 6 in. The power will be provided by two oil-burning water-tube marine boilers having a heating surface of 2200 sq. ft. The main engine will be vertical, inverted cylinder, direct acting, triple expansion type, dimensions 13 x 21 x 34 x 26 in. It is believed that the Government plant at Balboa can compete, at this time, with private plants in the United States on small hulls of this nature.

The Champion Engineering Co., Kenton, Ohio, has been organized to operate the plant of the Champion Iron Co., which was recently sold by the receiver. The new officers are: W. E. Norton, president; R. A. Valls, vice-president and general manager, and R. L. Miller, secretary and treasurer. The company will manufacture the line of electric traveling cranes made by its predecessor.

Testing Machine for Thread Gage Leads

A device which depends upon the principle of seeing light between two curved surfaces for its operation has been developed by the H. E. Harris Engineering Co., Bridgeport, Conn., for testing the lead and angle of thread gages. The device was first manufactured for use in the Bureau of Standards but has since been developed as a commercial proposition on account of the necessity which has arisen for the production of accurately threaded screws, taps and tap holes in connection with the manufacture of munitions. The work of testing is done by two angle test pieces which engage with the threads that are to be tested and a micrometer for indicating the deviation from the proper dimension.

The machine consists of a heavy cast bed to which the stationary head at the left carrying a fixed center is permanently fastened and a sliding tailstock at the right which can be fastened in position on the bed by two clamping screws. This tailstock carries a spring center *A* which can be withdrawn by the knob at the extreme right of the illustration or clamped in place by the screw *B*. The measuring devices are carried on the slide *C*, which is fitted to the bed and may be fastened in position by a thumb screw. This slide supports a second one of the compound type, the lower



The Accuracy of the Lead of Thread Gages Is Determined by Two Angle Test Pieces and a Micrometer Which Measures the Deviation from a Standard Distance

member of which *D* is adjustable toward and away from the line of centers, means for clamping it in the proper position for different diameters of thread gages being provided by the clamp screws *E*. The lower member supports a micrometer head operating against a hardened stud *F* in the upper member of the compound slide, which is provided with lateral movement parallel to the line of centers. The amount of this movement is measured by the micrometer head or by the use of distance gages between the point of the micrometer clamped stationary and the stud on the upper member.

Two angle test pieces, *G* and *H*, are mounted in the upper member of the slide. These are held by the spring clip *I*, which enables them to be adjusted toward or away from the gage or thread that is being measured by finger pressure. The center distances between the V's and the angle test pieces are exactly 1 in. apart, thus providing a basis for checking the error in the lead of gages which are made according to English measurement and are over 1 in. in length.

The gage to be tested is put between the centers by placing one center of the gage upon the fixed center at the left, bringing up the tailstock and clamping it in place and permitting the spring center *A* to go into the opposite center of the gage, after which the spring center is clamped in position. After the gage has been mounted in the machine it is turned on the centers until the thread permits the test point *H* to move into it and cut off light on both sides of the

cone point. After this point has been brought into engagement, the point *G* is then brought down. To measure the amount that the lead on the thread gage is long or short, the micrometer is set at zero and the point *H* is drawn back from the thread. This permits the point *G* to be moved in either direction.

The micrometer is then turned to move this test point until it is opposite the thread, when it is moved down to shut out the light. The distance that this point has to be moved indicates the amount by which the lead of the gage is long or short in 1 in.

Bailey Electric Furnace Installations

The Electric Furnace Co. of America, Alliance, Ohio, is installing at the plant of the Morris & Bailey Steel Co., Wilson, Pa., a continuous car type of electric annealing furnace for the bright annealing of strip steel and sheets. It will have a capacity of 150 tons per day.



Some of the First Operations in the Assembling of Motor Car and Truck Springs Being Performed on a Movable Platform Which Requires but 25 Men to Do the Work formerly Handled by 45 Employees

Among other installations of electric furnaces that are being made by this company are: A continuous furnace for the reduction of tungsten ore for the Crucible Steel Co., Pittsburgh; a heat-treating furnace for gears for the Pierce-Arrow Motor Car Co.; two billet-heating furnaces for steel forgings for the American Car & Foundry Co., Berwick, Pa.; an automatic heat-treating furnace for automobile crank shafts and other forgings for the Ingalls & Shephard Forging Co., Harvey, Ill.; a brass-melting furnace with a daily capacity of eight tons for the Bridgeport Brass Co., Bridgeport, Conn.; a similar furnace for the Hayes Mfg. Co., Erie, Pa.; an automatic heat-treating furnace for treating airplane parts for the Erie Specialty Co., Erie, Pa., and a large melting furnace for aluminum alloys with a daily capacity of 24 tons for the Aluminum Co. of America, at Massena, N. Y. Furnaces have been erected by this company and recently placed in operation for annealing locomotive axles in the plant of the Valley Steel Co., St. Louis, Mo., and a furnace for melting brass slabs for cartridges with a daily capacity of eight tons in the plant of the Baltimore Copper Rolling & Smelting Co.

The Suwanee Iron Co., Grand Rivers, Ky., recently organized with a capital of \$100,000, is planning for the early operation of its local iron furnaces, following remodeling and improvements. It is expected to blow in one furnace before the close of the month and the other by the first of the year.

Movable Platform for Spring Assembling

The Detroit Steel Products Co., Detroit, recently installed a movable assembling and inspection platform in its spring factory. Aside from cutting the number of men employed for this work almost in two, from 45 to 25, the company states that errors in assembling are minimized, the production is speeded up and the assembling of the spring leaves and their inspection before incorporation in the completed spring simplified. This platform is another of the special mechanisms developed by the company.

The platform, which has a daily capacity of approximately 40 tons of springs, enables the various operations entering into the assembling and inspection of springs for motor cars and trucks to be handled easily. There are in all 12 steps in the process of assembling and inspecting a spring. These are facing the long plate, reaming the eye, grinding the spring

ends, polishing the back and plates of the springs, riveting the clips, lubricating and assembling the leaves, inspecting for fit and to see that the spring leaves are all turned in the proper direction, the bulldozer and capacity tests, the placing and riveting of the clip bolts, and the final inspection. A brief description of the two tests and the apparatus employed in making them appeared in THE IRON AGE, May 17, 1917.

The first three stages are brought out in the illustration. At the right the first operation, that of grinding the sides of the curved loop at the ends to make it square and smooth, or, as it is termed, facing the long plate, is being performed. The reaming of the eye is next shown, this calling for an accuracy of 0.001 in. and perfect alignment with the backs. At the extreme right the ends of the springs are being ground.

Probably the first instance on record of the use of oxy-acetylene welding and cutting apparatus for the purpose of robbing a bank was the burglary of the State Bank at Waldo, Sheboygan County, Wis., on the night of Oct. 10. The vault door was removed by cutting out the time-locks, but the robbers were not successful in opening the burglar-proof safe within the vault by the same process. An attempt to blow open the safe with nitro-glycerine also failed. The loot consisted of \$1,200 in postage stamps and \$75 in pennies, taken from the vault.

GENERAL ADVANCE SOUGHT

Railroads Plan to Present Claims to Interstate Commerce Commission

WASHINGTON, Oct. 16.—Reports have been received here indicating that the American railways are planning to petition the Interstate Commerce Commission for permission to file a general advance in freight rates. It is stated that the advance in rates is necessary in view of the diminishing investment return now received by railway securities. Authorities insist that it is absolutely necessary to increase the investment return, otherwise persons will not desire to invest their money in railroads. On the other hand, it is significant that the petition for an advance is being discussed immediately after three new commissioners have taken their seats.

Members appointed to the Interstate Commerce Commission by President Wilson have been looked upon as favorable to the cause of the railroads. President Wilson appointed Commissioners Hall and Daniels. A new amendment has been enacted by Congress increasing the membership of the commission from seven to nine members. President Wilson thereupon appointed two new members and a third to fill the unexpired term of the late Judson C. Clements. President Wilson, therefore, has appointed five out of the nine members of the commission.

Upon the day following the first report that the railroads contemplate making their application for a general advance in freight rates, the commission gave notice of the recreation of a Board to handle all such petitions under the revision of the law. Heretofore the railroads could file advances in rates and the commission had authority to suspend such advances and investigate their reasonableness. Now the railroads are required to obtain the consent of the commission before they file their new tariffs.

The Administration is rather generously inclined toward the railroads. It is believed furthermore that the public is far more willing to give a sympathetic hearing to the cause of the roads than ever before because it is realized that the transportation systems of the country are taxed to their uttermost and that the increase in railway facilities should be encouraged in every way possible. The reports of the roads themselves of the increased work done as a result of the war bear out the necessity for extra equipment. The experience of nearly every shipper tends to prove the same thing.

According to a report just issued by the Railroads War Board, the freight statistics for July, the latest month for which official figures are available, show that the railroads successfully handled 20.2 per cent more freight that month than for the same period last year. The figures that tell the story of this accomplishment have just been compiled from railroads having 220,054 miles of track, or approximately 85 per cent of the entire trackage of the United States.

In July last year, these railroads gave service equivalent to carrying 27,809,430,998 tons of freight one mile, while this year they carried 33,434,368,526 tons one mile, an increase of exactly 20.2 per cent. This great increase in service was rendered with an almost negligible increase in the amount of equipment used. The number of freight locomotives in July last year, for instance, was 29,888, while this year the number was 30,277, an increase of only 1.3 per cent. Last year in July there were 2,204,902 freight cars in service, while this year the number was 2,256,621, an increase of 2.3 per cent.

One of the most encouraging marks of progress and one for which the railroad employees are entitled to credit is the great reduction in the number of freight cars and locomotives in the shop or awaiting repairs. Last year in July, there were 144,478 freight cars under or awaiting repairs, while this year only 135,831 were in that condition, a decrease of 6 per cent. Freight locomotives in repair or awaiting repair in July last year amounted to 4,460. In July this year only 4,122 needed shop attention, a reduction of 7.6 per cent.

Last year, the July statistics showed that railroad locomotives ran an average of 64.4 miles per day. In July this year, they made 68.8 miles. Freight cars made an average of 26.4 miles in July last year. This year they made 28.3 miles, an increase of 7.2 per cent.

German Imports and Trade After the War

Conditions and regulations to govern imports into Germany after the war or during the transition period are being discussed as follows in Germany, according to the London *Ironmonger*:

The Central Association of the German wholesale trade is publishing a series of pamphlets dealing with the conditions that are expected to prevail in various branches of industry during the so-called period of transition that, it is assumed, will follow the declaration of peace. The first of the series is written by Herr Lustig, general manager, German Iron & Steel Trading Co. (*Deutscher Eisenhandel*). Mr. Lustig believes that it is the intention of the German Government to establish monopolies for the importation of certain staple articles and to place the importation of raw materials in the hands of special organizations. He is not altogether in favor of such measures and while admitting that it would be injurious to abolish too rapidly the numerous organizations for the control of trade that have been set up during the war, he thinks that their mode of working should be changed and that they should use the merchant class, which has now been almost entirely squeezed out, as intermediaries.

If all imports are to be monopolized, either by the government or by central organizations, each representing a different industry, enormous sums of money will have to be sent abroad to pay for the goods bought. But if wholesale and export traders are used as intermediaries in buying, their old business relations in foreign markets, resumed after the war, will be available to establish credit and will make it possible to get better terms and to distribute the payments so as to make them less oppressive.

It will be necessary to push as much as possible the exportation of goods of high intrinsic value, such as potash and coal tar products, and thus to establish credits in foreign countries. All this will be made easier if all purchases abroad are made not by the Government or the manufacturers direct but by committees consisting of representatives of the manufacturers, the merchants and ship-owners. Private trade should be left unfettered, on condition that all goods sent to Germany shall be consigned to one or another of these committees.

The author thinks that the government should have a certain control over the selling prices of imported goods, as he is afraid that otherwise speculation may raise those prices to inordinately high levels, and he advocates that the government shall fix the maximum prices which the buying organizations will be allowed to pay for goods bought for Germany. He would also set up a central organization whose business it would be to see that the imports were restricted to urgent necessities and that they were fairly divided so that no industry or no one state of the Empire could get an advantage over the other.

Japan Wants Blast Furnaces

Japan is now seeking to buy blast furnaces. It is likely before long that the sale of perhaps five will be effected. This will naturally require the dismantling of the furnaces and transporting them for erection in Japan. The exporting of blast furnaces has in fact become a new feature in the iron and steel industry. It was reported in *THE IRON AGE* of Aug. 30 that the furnace at Battelle, Ala., is now in process of demolition to be shipped to India and this exporting follows the earlier movement of moving blast furnaces from poorly located places to spots where immediate use may be made of them.

New Dutch Steel Plant

LONDON, ENG., Oct. 16 (*By Cable*).—A Netherland blast furnace steel and rolling works has been formed in Holland, capital 25 million gulden, the Dutch Government participating. The rolling mill output will be 150,000 tons, chiefly shipbuilding material.

The Shenango Furnace Co., Pittsburgh, has subscribed for \$1,250,000 of bonds. Employees of the Farrell and Sharon, Pa., works of the Carnegie Steel Co. have subscribed for over \$300,000 of new Liberty bonds.

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The Fixed Steel Prices

From the beginning of the talk of steel price control it has been hoped that the complexity of the relations of the various products would not prove incapable of fairly satisfactory adjustment. The belief was strong in those of widest trade experience that a harmonious or well balanced price structure could be produced without serious difficulty, if merely the scale should be established. That scale was fixed by the agreement between the Administration and the large producers announced Sept. 24, setting pig iron at \$33, Valley, for basic and foundry, and steel bars, shapes and plates at 2.90c., 3c. and 3.25c. respectively. The additional prices announced late last week are in harmony with these basis prices.

While it required somewhat protracted discussion to reach an agreement upon the prices announced in this second batch, and while the fixing of prices on certain commodities had to be deferred, these phases of the procedure are not inconsistent with the assumption that as a mathematical, an accounting or a technical problem the task of relating prices is not discouragingly difficult. The slow progress made arose from the fact that there are diverse interests to be harmonized. All manufacturers must be brought into accord, the finished product of the one being the raw material of the other. Even the War Industries Board is not disinterested, for it must assume a tactical position to make sure, when basis prices are fixed, that other prices are not placed disproportionately high.

Whether demand and supply should control the general level of prices is a question upon which much can be said. The strongest argument for price fixing is that competition as a price maker has lately been merely a phrase, for the competition that has been defended as a principle of sound trade has been competition between sellers, whereas the competition of late has been between buyers—an altogether different thing.

That the law of supply and demand, or of competition, has in recent months produced anything like reasonable relations between prices of different commodities in the iron and steel industry cannot, of course, be maintained for an instant. It is of interest to observe the incongruities produced, by

comparing the relations in the price structure now being built up, quite a consistent one, with the relations that have existed at times in the past.

Now there are prices of \$33, Valley, for basic iron and \$47.50, Valley or Pittsburgh, for 4 x 4-in. steel billets. In the first stage of their rapid ascent billets were quoted in THE IRON AGE at \$45 in the issue of Aug. 17, 1916, while at the same time pig iron was quoted at \$18. The billet quotation then jumped to \$50, when pig iron was quoted at \$20, so that we have the equivalent of \$47.50 billets and \$20 pig iron, made by the market, instead of \$33 pig iron. In the other direction we have it that when billets rose to \$50 grooved steel skelp was quoted at only 2.50c., whereas now the relation of \$47.50 billets and 2.90c. skelp seems much more reasonable. Then there was a time, late in the spring of 1916, when prices ranged from low to high for the following commodities: No. 28 gage black sheets, merchant steel bars, No. 10 gage blue-annealed sheets, plates. Mills now would not regard it as consistent for blue-annealed sheets to be placed below the 3.25c. plate price, or for No. 28 gage black sheets to be set still lower, and below the 2.90c. bar price. A sad mess would have been made, in other words, if the Government, in seeking for a reasonable price schedule, had suggested that the iron and steel industry select its date in the past, the prices upon which date should be accepted as the market prices in the future. As an example of the incongruities above referred to, the date of \$32 pig iron (the market jumped from that to \$35) was the date of \$65 sheet bars and 5c. black sheets, and the sheet manufacturers would certainly object either to the sheet bar price or the sheet price, probably to both.

The structure of fixed prices now being developed makes a favorable comparison even with the normal markets before the war boom. The prices are graduated from raw material to finished product. In periods both of low prices and of high prices the open market prices have not shown a spread equal to manufacturing cost between billets and slabs on the one hand and merchant bars and plates on the other. Roughly speaking, when prices were low and when they were high a net ton of the finished product has been quoted at little if any above a gross ton of the raw material. If

the detached finishing mill made a profit at all it was by holding a low-priced contract for its raw material and selling its finished product on a spot market—rather a precarious performance at best.

Price Control Enforceable

The question has arisen whether the agreements made between the Government and various groups of producers, on the "one price for all" basis, will be kept by all producers. The natural assumption is that when an agreement is entered into in good faith it will be kept. In the case of the agreement on steel prices it is generally inferred that while a minority, which is relatively small, was not directly represented at the Washington conferences, those constituting such a minority will also feel duty bound to act accordingly.

Assumption or inference, however, is not sufficient in a matter of such importance. Everyone wants to know positively whether the agreement is going to be the rule throughout the trade with respect to all the producers and with respect to all the sales they may make. While doubt seems to have arisen in the minds of some buyers, it would appear that such doubt does not rest upon evidence that would really bear upon the general question, whether or not the agreement will be kept in its entirety. There have been, for instance, numerous refusals of producers to sell at the set prices. It must not be understood, however, that the agreement was that the producers would sell. The spirit of the agreement was that sales when made would not be at above the set prices, and furthermore that producers would strive to maintain output.

The great majority of buyers have shown a disposition to accept the agreement on its face and to feel that the question of price has been eliminated, while there necessarily remains the equally important question of deliveries. There is no occasion for the mills to sell or the buyers to buy material that cannot be delivered, but it would be much more satisfactory to both producers and buyers to know that the Government has means that it can bring into play to compel adherence to the agreement. Producers would not feel comfortable at the prospect that non-adherents would be rewarded for failing to support a Government measure. If 90 per cent of the producers adhered to the agreement, and the remaining 10 per cent sold to the highest bidder, the premium bid would be much greater than if all producers sought to sell at a premium. Nor would consumers feel comfortable if the measure of their success in staying in business by securing deliveries of steel were their willingness to tempt producers to violate the agreement.

The fact is that, while the Government has no direct way of enforcing a general agreement as to prices, it has power to punish a certain number of violators. It has ample authority to commandeer any plant or part of plant needed to furnish it material for prosecuting the war. It has made no threat, and has had no occasion to make any threat, with respect to its intention thus to deal with any steel manufacturer disposed to be a slacker, but its power remains. Any plant suitable for the display

of such power can be selected. Merely for the purpose of increasing the production of war material the natural selection would be of a plant not already so engaged, but capable of being thus employed. Plant facilities entirely unsuited to making war material would be excluded, but there is no prospect of there being any question as to the price of the product of such plant facilities.

The Government's absolute authority lies in the priority regulations. All matters relating to sequence in producing and shipping material have been placed in charge of the Priority Board, which assumes authority both over the machinery of production and over the machinery of transportation. From the practical viewpoint the question of its power is not whether the Priority Board has full legal authority, but whether anyone is going to take the Board into court. The second question suggested is easier to answer than the first.

The first function of the Priority Board is to see that the United States Government receives its war material as soon as it needs it. Its second activity is in connection with material destined for the Government's Allies. Its third activity is in connection with material destined for others. No one can question the full propriety and legality of the Government's war steel being given precedence over everything else. Once the manufacture and shipment of a single ton of steel is delayed by preference being given to a Government order, however, the normal course of trade is interfered with, and it is no great step for the Government next to determine what steel shall thereby be delayed in manufacture and shipment. It is well known that the Priority Board has assumed this attitude and contemplates the regulation of all classes of shipments as far as may be necessary. Should a case arise of a manufacturer selling at a price higher than the maximum that has been set, there is little doubt that the Board would forbid the filling of such an order until after taking care of all other orders.

Undivided Loyalty Demanded

For many years it has been the well-established custom of the Government to discourage its employees from becoming members of labor unions, and it is rather surprising that the recent organization of a National union, which it is hoped by the organizers will include all Federal employees, has not attracted more attention. It was announced at the convention which was held in Washington that there are now sixty local unions of Government workers in the United States, and it is planned to organize 600,000 civil employees of the Government. Perhaps the most remarkable feature of this new movement is that it is made at a time when it has been agreed by representatives of employers and employees, including Secretary Wilson of the Department of Labor, that neither labor nor capital should make any effort to change the status of the working conditions as long as the war continues. In other words, the open shops should remain open and the closed shops should continue closed and other fundamental working conditions should not be changed. This understanding has

been generally adhered to, but the movement to unionize Federal employees is a direct departure from the policy recently adopted.

The reason for not encouraging or even permitting Federal employees to become members of unions is entirely sound, as it is based on the fact that Government service demands absolutely unqualified loyalty, and it is well known that when any question arises between employer and employee, the union man believes that his loyalty is due first to his union. It has been clearly recognized that such a condition in the post office and other branches of the Government would be intolerable.

On account of some real service which Mr. Gompers has rendered in the present war period and owing to some other reasons not so sound, he has had a very important influence with the Administration. He has been particularly active in the organization of the new union, and undoubtedly will have a large following, but it is hoped that the patriotism and common sense of Government employees will prevent them from rushing into this new organization and that they will be true to the time-honored position of the Government which demands unswerving loyalty from its employees.

British Steel for Shells

The British investigation of an acid open-hearth heat for making high explosive shells, reviewed in this issue, presents some interesting facts. It demonstrates the high degree of uniformity obtainable from the practice of casting the ingot large end up with a hot top. Not only is the percentage of discard largely reduced, but defects from segregation and pipe are at a minimum. It would be interesting to know to what extent this is the practice in England. Without doubt some such procedure is desirable to meet the rigid specifications. It is admitted that in the United States early in the war some steelmakers had great difficulty in satisfying foreign inspectors with steel cast in ingots with the small end up with no hot top or even with one. To what extent this American practice has been altered to meet new war conditions is not generally known, but in some cases decided changes are believed to have been necessary. It is certain, however, that the British method referred to is superior.

It is also interesting to note that in the heat under discussion additions of manganese and silicon were made in the bath and not in the ladle, and also that no ore was added after the percentage of carbon reached 0.70 per cent. Both of these points are vitally important in the production of the best steel, but their value is not always recognized or lived up to in tonnage production.

The manganese content of the slag for the heat reported is illustrative not only of the loss of manganese, but also of the importance of the slag as a by-product. It is hoped that steel making will some day reach the stage where so large a loss can be eliminated. It is claimed that this has been done in the electric furnace. It is also not at all impossible that a way may yet be worked out for reclaiming the manganese, silicon and iron content

in acid slags in the shape of a silico-manganese alloy. Important work on this is now being done in this country.

MANY ORDERS PLACED

Active Buying of Machinery in the Pittsburgh District

PITTSBURGH, Oct. 15.—Conditions in the local machinery trade have not been so active at any time since the war started as they are at present. Local builders of heavy machinery equipment are being deluged with Government orders, and local sales agents for New England, Cincinnati and other places where shops for building machinery are located, are receiving enormously heavy inquiries for machine tools, nearly all for Government work. Very heavy orders have been placed lately, and others are being figured on and will be given out shortly. Local companies are going into the manufacture of war munitions on a large scale, and their needs of general machine-shop equipment are very heavy. The Westinghouse Air Brake Co. has taken a Government contract for 2500 Rohn aeroplane motors, and has lately bought a very large quantity of lathes, planers, milling machines, shapers and other equipment. It will still be a buyer of considerable machine-shop equipment, and will have other inquiries out in the market in a short time. The Westinghouse Electric & Mfg. Co. has taken a large Government order for hand grenades, and has been a very heavy buyer of machine tools, placed with New England, Cincinnati and other manufacturers. The company will make these hand grenades at its shops in this city and will need a large quantity of additional tools. The Pittsburgh Steel Products Co., which is building a new seamless tube mill at Allenport, across the river from Monessen, Pa., is also buying heavily of machine tools, and will continue a heavy buyer for some months to come. The Carnegie Steel Co. is buying heavily of miscellaneous machine tools. Nearly all the orders being placed are for Government work for quick shipment. A local company which recently took a large Government order for machine-shop tools for 90 days' delivery, has been advised by the Government that it wants these tools shipped in 30 days. The fact that the Government wants its material quickly, and that its orders are taking preference over all other orders, is making it hard for companies that want machine tools for domestic work to get deliveries. Local conditions among machine-tool builders are getting worse, as men are responding to the draft, and it is impossible for them to get out a maximum output of tools. Prices are showing some advance, and the scarcity of steel and labor is being severely felt.

The Edgewater Steel Co., whose plant is at Oakmont, Pa., has taken a large Government order for 9.5-in. guns, and also for 155 mm. guns. This company is having built one 6000-ton high-speed steam hydraulic forging press, and one 3000-ton press, both by the United Engineering & Foundry Co., Pittsburgh. These presses will be delivered shortly, and will be used by the Edgewater Steel Co. in making forged steel car wheels and Government munitions. In addition, the Edgewater Steel Co. has just placed a contract with the United Engineering & Foundry Co. for another 2000-ton steam hydraulic high-speed forging press, and also a contract with the Morgan Engineering Co., Alliance, Ohio, for a 1000-ton press of the same type. The Edgewater Steel Co. sent out under date of Oct. 10 an inquiry for a long list of boring lathes, turning lathes, planers and other miscellaneous tools for which it expects to close this week.

This list is as follows:

Two boring bar lathes 26-in. x 32-ft. centers, with two steady rests, and with one carriage, carrying front and rear tool posts.

Two cutting off lathes, 36-in. x 26-ft. centers, with two carriages each carrying front and rear tool posts, the carriages to feed toward each other, as well as toward the head-stock.

Two heavy duty drill presses with adjustable tables, with a capacity for drilling 4-in. holes. These to be used with the hollow drills for taking out test pieces

Two tool grinders.
Two test bar grinders.
One 26-in. heavy duty shaper.
Two cold saws with 60-in. diameter saws.
Two cold saws with 48-in. diameter saws.
One 24-in. heavy duty slotter.
One centering machine for 24-in. diameter.
Two test bar lathes 20 in. x 8 ft.

Boring Lathes for 9.5-in. Guns

Two 36-in. to bore 24-ft. long for tubes.
Four 48-in. to bore 12-ft. long for jackets.
Two 36-in. to bore 10-ft. long for hoop.

Boring Lathes for 155-Mm. Guns

Two 36-in. to bore 24-ft. long for tubes
Two 36-in. to bore 12-ft. long for hoop A.
Two 36-in. to bore 12-ft. long for hoop B.
Three 48-in. to bore 12-ft. long for jacket.
All boring lathes to have one carriage in addition to boring bar feed, with two steady rests on the 24-ft., the shorter ones to have one steady rest.

Turning Lathes for 9.5-In. Guns

Two 42-in. x 24-ft. centers for tubes
Two 36-in. x 10-ft. centers for hoops.
Four 48-in. x 12-ft. centers for jacket.

Turning Lathes for 155-Mm. Guns

Two 36-in. x 24-ft. centers for tubes.
Three 48-in. x 12-ft. centers for jacket.
All 24-ft. turning lathes are to have two taper attachments and the shorter ones each to have one taper attachment, except when some method of turning taper by the former is provided.

Planers

Three 36 x 36 x 12 ft.
Two 48 x 48 x 12 ft.
Four 48 x 48 x 16 ft.

All to have two heads on cross rail and one side head.

The Steel Industry in Australia

The demand for rails has been so great, states the British Trade Commissioner of Australia, that since the inception of the Broken Hill Proprietary steel works at Newcastle, N. S. W., the company has been unable to roll plates and sheets. Large quantities of rails have been turned out for the Commonwealth Government Railway and channel sections are at present being rolled to the order of the government. The Commissioner has been informed that the company can roll 4-ft. plates, but not 5-ft. plates, the size most suitable for shipbuilding. When it is in a position to roll plates and sheets a large market for its products will be opened up in Australia, and it will then be possible to establish galvanizing and tin-plate industries there. A firm has already purchased land near the steel works with a view to the erection of a galvanizing plant. Other prospective developments in connection with the steel works include wire drawing and the manufacture of wire nails. The present installation of coke plants consists of 66 Solvay ovens and a considerable increase is proposed.

Large Decrease in Steel Corporation Orders

The monthly statement of the United States Steel Corporation of unfilled orders on its books on Sept. 30 shows a total of 9,833,477 tons or a decrease of 573,572 tons from the previous month, when the total was 10,407,049 tons. This is the first time the unfilled orders have fallen below 10,000,000 tons since September, 1916, when they were 9,522,584 tons. The following table gives the unfilled tonnage of the United States Steel Corporation at the close of each month since January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June	11,383,287	9,640,458	4,678,196	4,032,857
July	10,844,164	9,593,592	4,928,540	4,158,589
August	10,407,049	9,660,357	4,908,445	4,213,331
September	9,833,477	9,522,584	5,317,618	2,787,667
October		10,015,260	6,165,452	3,461,097
November		11,058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

The National Steel Products Co., Ensley, Ala., has taken bids for the construction of a new plant at Bessemer for the manufacture of steel castings for railway appliances. The initial works will be about 40 x 150 ft., with capacity of 15 tons daily. A 3-ton open-hearth furnace will be installed. J. V. Calvin is secretary.

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Agreed Prices on Semi-finished Lines

White House Announces New Schedule on Billets, Blooms, Sheet Bars, Wire Rods and Shell Bars, Judge Gary Expresses Satisfaction

WASHINGTON, Oct. 16.—Following the two-day conference with the representative steel producers last week, the War Industries Board, with the approval of President Wilson, promulgated fixed prices on blooms, billets, slabs, sheet bars, wire rods and shell steel bars. Those participating in the conference included the board, and the iron and steel committees of the American Iron and Steel Institute. Another conference will be held the latter part of the current week to review proposed fixed prices on other finished articles. It was reported that a schedule of these prices had been drafted but will not be promulgated until those interested have had an opportunity to express their opinions.

While the prices promulgated last week represented considerable cuts in the prevailing market prices, it was said they are generally satisfactory to the trade. These prices are in harmony with the fixed prices on the basic articles which were promulgated by President Wilson on Sept. 24, last. Among those articles upon which prices will be determined are wire, pipe, rails, nails, hoops, bands, cotton ties, tin plate, rivets and spikes. Until these prices are announced, however, the trade itself will continue to apply its own prices as well as its own differentials.

The further prices fixed last week were formally an-

nounced by the White House through the Committee on Public Information.

Officials of the War Industries Board who have charge of the steel price question hope to announce further prices the latter part of the current week or the first of the next. A conference of such steel men as are directly interested in these other articles will be arranged to-morrow, according to information given the representative of THE IRON AGE. The steel men who conferred with the War Industries Board last week included the following:

General Committee, Elbert H. Gary, chairman; James A. Farrell, vice-chairman; James A. Burden, E. A. S. Clarke, Alva C. Dinkey, Willis L. King, Charles M. Schwab, John A. Topping.

Members of the subcommittees who were present included the following: Sheet Steel, W. S. Horner, Charles O. Hadley, Walter C. Carroll; Scrap Iron and Steel, Eli Joseph, Samuel Deutsch, Vernon Phillips, Joseph Michaels.

The chairmen of all the subcommittees were in attendance. These included, in addition: Ferroalloys, Mr. Farrell; Pig Tin, John Hughes; Pig Iron, Ore and Lake Transportation, H. G. Dalton; Tubular Products, James A. Campbell; Cold-rolled and Drawn Steel, F. N.

PRESIDENT APPROVES STEEL PRICE AGREEMENT BETWEEN WAR INDUSTRIES BOARD AND MILLS

The following is the official statement issued by the War Industries Board of the Council of National Defense:

The President has approved an agreement between the War Industries Board and the steel men, fixing the following maximum prices, which become effective immediately, and are subject to revision Jan. 1, 1918, viz.:

Commodity	Price Agreed Upon	Base
Blooms and billets 4 by 4 in. and larger.....	\$47.50	Pittsburgh and Youngstown.
Billets under 4 by 4 in.....	51.00	Do.
Slabs	50.00	Do.
Sheet bars	51.00	Do.
Wire rods	57.00	Pittsburgh.
Shell bars:		
3 in. to 5 in.....	3.25	Do.
Over 5 in. to 8 in.....	3.50	Do.
Over 8 in. to 10 in.....	3.75	Do.
Over 10 in.....	4.00	Do.
Skelp:		
Grooved	2.90	Do.
Universal	3.15	Do.
Sheared	3.25	Do.

¹ Gross tons.

² Per 100 lb.

The prices enumerated have been fixed by the President on the assurance of those representing the steel industry that these prices equitably adjust the relations of the steel interests to each other, and will assist them in fulfilling their obligations to give the country 100 per cent of production at not to exceed the prices heretofore announced.

Measures will be taken by the War Industries Board for placing orders and supervising the output of the steel mills in such manner as to facilitate and expedite the requirements for war purposes of the Government and those nations associated with us, and to supply the needs of the public according to their public importance and in the best interest of all, as far as practicable.

A spirit of co-operation was manifested by the steel men, and no doubt is entertained that every effort will be made to bring the production as nearly as possible up to the extraordinary demands resulting from the war.

Beegle; Wire Products, Frank Baackes; Wire Rope, Karl G. Roebeling; Malleable Castings, Frank J. Lanan.

Judge Gary Satisfied

E. H. Gary, chairman of the United States Steel Corporation, said after returning to New York, that the steel industry generally will be benefited by the attitude and action of the War Industries Board and the President in fixing prices for steel products.

"On the whole, it may be said," asserted Mr. Gary, "the negotiations with the War Industries Board and the results were satisfactory to the steel producers, although the prices named are lower than had been expected."

"The disposition of the members of the board carefully to inquire into the facts relating to costs, capacity, facilities and profits has been so fair and frank that the manufacturers without exception will be influenced to respond to the requests of the board for production equal to full capacity. And the prices determined upon will, with some adjustments between manufacturers as to deliveries, yield profits sufficient to bring them within the President's original proclamation."

"The prices of commodities not already considered by the board will be fixed by arriving at a parity."

"The steel industry generally will be benefited by the attitude and action of the War Industries Board and the President. The profits of some of the manufacturers will be somewhat decreased. However, conditions will be more normal and they will be healthy."

LIBERTY BOND BUYING

Subscriptions of Employees Not as Numerous as for First Offering

Many manufacturers are again responding and subscribing for Liberty Loan bonds, but the movement to interest employees does not seem to be as general and fear is expressed that the number of workmen represented in subscriptions will be much smaller than it was at the time the first issue was subscribed for. There is, however, a feeling that interest will soon be quickened, especially by the observance of Oct. 24 as Liberty Bond Day, and that the bonds will be oversubscribed.

Among New York subscriptions were: Lackawanna Steel Co., \$1,000,000; International Nickel Co., \$1,000,000; Worthington Pump Machinery Corporation, \$500,000; The American Steel Export Co., \$100,000; American Locomotive Co., \$2,000,000.

Zalmon G. Simmons, founder and president The Simmons Co., Kenosha, Wis., manufacturer of steel beds and springs, has made a subscription to \$250,000 of Liberty bonds. The subscription was made at Madison, Wis., on Oct. 3, when W. G. McAdoo, secretary of the treasury, delivered an address to the people of Wisconsin.

The Republic Iron & Steel Co. will be a heavy subscriber to the new Liberty Loan bonds and has placed \$800,000 of its subscription through Youngstown, Ohio, banks and \$1,000,000 with Cleveland banks. Just what the total amount of the subscription of the Republic company to the Liberty Loan bonds will be has not been determined, but will depend largely on further developments in regard to excess-profit taxation. The company subscribed \$5,000,000 to the first Liberty Loan bonds, and its subscription to the second will likely be the same.

Among the subscribers to the second Liberty Loan made in Cleveland were the following: Pickands, Mather & Co., \$1,000,000; Corrigan, McKinney & Co., \$1,000,000; Aluminum Castings Co., \$50,000; McMyler Interstate Co., \$250,000; National Acme Co., \$100,000.

Employees of plants in and near Chester, Pa., are doing their part to help the country by subscribing to the Liberty Loan. Big meetings were recently held at the plants of the Penn-Seaboard Steel Co. and the

Baldwin Locomotive Works resulting in large subscriptions being made by the workers.

Ferdinand Schlesinger, head of the Northwestern Iron Co., Milwaukee; Newport Mining Co., and various other large mining, furnace and chemical interests, thus far is the largest individual subscriber in Milwaukee to the second Liberty Loan, having purchased bonds amounting to \$500,000 for his personal account. Other large subscribers thus far are: Allis-Chalmers Mfg. Co., \$300,000; Harley-Davidson Motor Co., \$200,000; Cutler-Hammer Mfg. Co., \$200,000; Pressed Steel Tank Co., \$100,000; Shadbolt & Boyd Iron Co., \$25,000; Milwaukee Steel Foundry Co., \$10,000; Heil Co., \$10,000; Mechanical Appliance Co., \$25,000; Vilter Mfg. Co., \$35,000; Federal Malleable Co., \$25,000; Richardson-Phenix Co., \$50,000; Wisconsin Motor Mfg. Co., \$10,000. The Aluminum Goods Mfg. Co., Manitowoc, Wis., has made a subscription of \$150,000.

Tuesday was a day of large subscriptions in New York, including American Can Co., \$1,000,000, Midvale Steel & Ordnance Co., \$1,500,000, and Phelps-Dodge Corporation, \$1,000,000.

The McKeesport Tin Plate Co., McKeesport, Pa., has subscribed \$1,500,000 for the second Liberty Loan bonds, and the Aluminum Co. of America, Oliver Building, Pittsburgh, has subscribed the same amount.

Manufacturers in the Pittsburgh district are subscribing very liberally for the second Liberty Loan bonds. The latest subscriptions reported are as follows: Pittsburgh Coal Co., \$2,500,000; Henry W. Oliver estate, \$500,000; Oliver Iron & Steel Co., \$1,000,000; Oliver & Snyder Steel Co., \$500,000; W. Harry Brown, \$500,000; Gulf Oil Corporation, \$1,500,000; Harbison-Walker Refractories Co., \$2,000,000; Firth-Sterling Steel Co., \$500,000, and Ohio Fuel & Supply Co., George W. Crawford interests, \$320,000.

The Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has subscribed for \$1,000,000 of Liberty Loan Bonds.

Mahoning Valley Responds

YOUNGSTOWN, Oct. 15.—At a meeting of the directors of the Brier Hill Steel Co. held here this afternoon, it was voted unanimously that the company take \$2,000,000 in Liberty bonds. Employees of the Youngstown Sheet & Tube Co., in a campaign promoted by the company officials, have taken a large block of the Liberty bonds. Every steel concern in the Mahoning Valley is lending its assistance to the Liberty bond sale.

New Pittsburgh Subscriptions

PITTSBURGH, Oct. 17 (By Wire).—The Lockhart Iron & Steel Co., Pittsburgh, has subscribed \$300,000 for Liberty Loan bonds; the Jones & Laughlin Steel Co., \$2,000,000; Crucible Steel Co. of America, \$1,500,000, and American Window Glass Co., \$350,000.

Ford Makes Large Subscription.

DETROIT, Oct. 16.—Detroit's Liberty Loan drive received powerful impetus to-day when it was announced that Henry Ford had contributed \$5,000,000, and that the Ford Motor Co. had made a similar contribution. Ford's subscription was accompanied by a statement declaring that the United States, in making war on Germany, did the "best thing that ever happened for the world."

The announcement of Ford's subscription and his statement was made at the noon meeting of the Liberty Loan committee. Detroit has now subscribed more than \$25,000,000 to the second loan.

The Chicago Shipbuilding Co. launched the first boat in the United States to be built under the direction of the Emergency Fleet Corporation Oct. 13. Frank L. La Marshe, general superintendent of the yards at 101st Street and Calumet River, South Chicago, had charge of the ceremonies. The boat is 261 ft. over all, has a 43½-ft. beam, a depth of 20 ft. and a capacity of 3000 tons. It was named the War Hound. Two other boats are being constructed in the same yards, and men are working day and night to finish them.

Iron and Steel Markets

FURTHER PRICE FIXING

Import of Semi-Finished Steel Settlements

Wire Price This Week—Little Business Except in Iron at New Prices

That Government price fixing is all of the herculean task that the trade prophesied is borne out by the fewness of the items covered in the two agreements so far made. As indicated in THE IRON AGE last week only semi-finished steel was included in the announcement of Oct. 11. Just when additional maximum figures will be settled on is not clear, but it is likely, now that ratios have been established for conversion differences between raw materials and semi-finished products and between the latter and finished forms, that further Government prices will be arrived at without requiring general sessions in Washington between the War Industries Board and the producers.

Whatever the basis of the adverse criticism already developing, the underlying object in the price fixing seems clear—to secure a condition which will bring out 100 per cent production. A surprising low billet price, \$47.50, out of line somewhat, other differences in prices being considered, makes for a wide spread between the steel for, and the steel as finished product. Clearly less concern is thus shown for the billet producer, with his relatively less margin between pig iron and scrap and the billet. On the score of accelerating mill operations may be accepted \$47.50 billets on the one hand and \$58 and \$60 for bars and beams on the other and \$50 for slabs against \$65 for plates.

The fact that plates are put at \$5 and \$7 per ton higher than bars and beams is also perhaps a recognition of the special cases of recent additional mill capacity entailing high capital charges, with similar incentive to encourage slab production at \$2.50 per ton more than billets.

On high Government authority it is intimated that the industry is to adjust itself to the new base prices, particularly in the matter of adopting usual trade practices without specific announcements in this regard. It is not clear as yet, however, that producers are expected to take any initiative in revising prices of major commodities not yet covered. Approximations as to what they may be, discounting special conditions, may be ascertained by comparing the new prices with the average of those for the years 1911 to 1914, inclusive, the four-year period before the war demand developed. The producers have used quotations of THE IRON AGE for this interval as the basis of their figures in deliberating with the War Industries Board.

Before the end of the week, the base for wire will probably be fixed. A figure a little above the mean between the quotation of the largest maker

and the higher one of the others would harmonize with the rest of the new prices. The spectacle of raising the price acceptable to the one vanishes when it is recalled that it has long been made on much deferred deliveries.

Old material as well as sheets and tubular goods are also shortly to be settled. As yet steel rails have been given little attention. Chicago as a basing point bids fair to stay. The contention is that largest buyers in the Middle West have commonly been billed without including the Pittsburgh-Chicago freight rate. Tin plate, which involves the cost of the imported covering material, will probably be considered, as desired by producers, by the Food Administration Board.

Outside of Government orders, business has been light. Sales of steel have been made at both the fixed prices and higher, the latter, like 1000 tons of billets at \$50, for immediate delivery, representing largely the closing of options made before the price announcements. The signs are that before long sales will be sufficiently numerous to establish a public market at the agreed figures.

Following a drop of \$15 in cast-iron pipe in Chicago last week comes one of \$9 in the East. Ferromanganese has also been reduced. Some drop in warehouse plate prices is also noted. Against these is the likelihood of advanced freight rates.

Government purchases include fully 30,000 kegs of nails and 8000 tons of steel pipe; and 30,700 cars which the United States is to put into Russia, are about closed. Upward of 100,000 tons of structural steel will shortly be bid on for ships.

The pig iron market has been characterized by a more general and more cheerful acceptance of the agreed prices than has prevailed in the finished and semi-finished markets. Considerable selling has been made on the basis of \$33, furnace, for iron analyzing 1.75 to 2.25 per cent silicon. The recommendations as to details of schedules submitted to Washington have not yet been acted on. Sales of basic have included 20,000 tons in the Philadelphia district. There is no difficulty in placing iron offered for sale, and several makers have withdrawn from the market. Some buyers who bought iron at high prices are asking to have their contracts re-adjusted, but this has not generally been done.

Pittsburgh

PITTSBURGH, Oct. 16—(By Wire).

The additional prices on steel announced by the Government last week—\$47.50 on billets, \$51 on sheet bars and small billets, and prices on shell steel, skelp and other materials—have helped to clear the situation to some extent, but the trade is still anxiously waiting for the Government prices on close to 100 other items of finished steel that have not yet come out. Included in these are sheets, iron and steel pipe and boiler tubes, light and standard section rails and other important products. The trade is holding off placing orders until these prices are announced, and new buying is almost at a standstill. There have been very few new sales of pig iron, and other materials at prices fixed by the Government on Sept. 24. In the item of plates, there

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 17, 1917.	Oct. 10, 1917.	Sept. 19, 1917.	Oct. 18, 1916.
No. 2 X, Philadelphia...	\$34.25	\$34.25	\$50.00	\$20.50
No. 2, Valley furnace...	33.00	33.00	50.00	20.00
No. 2, Southern, Cin'tl...	35.90	....	49.90	18.40
No. 2, Birmingham, Ala.	33.00	....	47.00	15.50
No. 2, furnace, Chicago**	33.00	....	54.00	19.00
Basic, del'd. eastern Pa.	33.75	32.75	48.00	20.00
Basic, Valley furnace...	33.00	33.00	42.00	20.00
Bessemer, Pittsburgh...	37.25	37.25	50.95	23.95
Malleable Bess., Ch'go**	....	....	55.00	19.50
Gray forge, Pittsburgh...	32.75	32.75	46.95	20.45
L. S. charcoal, Chicago...	....	....	58.00	20.25

Rails, Billets, etc., Per Gross Ton:	Oct. 17, 1917.	Oct. 10, 1917.	Sept. 19, 1917.	Oct. 18, 1916.
Bess. rails, heavy, at mill	....	....	\$38.00	\$33.00
O.-h. rails, heavy, at mill	....	....	40.00	35.00
Bess. billets, Pittsburgh...	*\$47.50	55.00	65.00	45.00
O.-h. billets, Pittsburgh...	*\$47.50	55.00	65.00	45.00
O.-h. sheet bars, P'gh...	*\$51.00	....	75.00	45.00
Forging billets, base, P'gh	....	....	100.00	69.00
O.-h. billets, Phila...	....	....	75.00	50.00
Wire rods, Pittsburgh...	*\$57.00	85.00	90.00	55.00

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia...	4.25	4.25	4.935	2.659	
Iron bars, Pittsburgh...	....	....	4.75	2.75	
Iron bars, Chicago...	4.50	....	4.50	2.35	
Steel bars, Pittsburgh...	†\$2.90	....	4.00	2.75	
Steel bars, New York...	....	....	4.195	2.919	
Tank plates, Pittsburgh...	†\$3.25	....	8.00	4.00	
Tank plates, New York...	....	....	8.195	4.169	
Beams, etc., Pittsburgh...	†\$3.00	....	4.00	2.75	
Beams, etc., New York...	†\$3.195	....	4.445	2.869	
Skelp, grooved steel, P'gh	*\$2.90	....	....	2.50	
Skelp, sheared steel, P'gh	*\$3.25	....	....	2.60	
Steel hoops, Pittsburgh...	....	....	5.75	3.00	

*Agreed prices. †As yet only a few sales made.

**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Oct. 17, 1917.	Oct. 10, 1917.	Sept. 19, 1917.	Oct. 18, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	3.30
Sheets, galv., No. 28, P'gh	9.50	4.40
Wire nails, Pittsburgh...	4.00	2.70
Cut nails, Pittsburgh...	4.85	2.60
Fence wire, base, P'gh...	3.95	2.65
Barb wire, galv., P'gh...	4.85	3.55

Old Materials, Per Gross Ton:	Oct. 17, 1917.	Oct. 10, 1917.	Sept. 19, 1917.	Oct. 18, 1916.
Iron rails, Chicago...	\$36.00	\$36.00	\$44.50	\$20.00
Iron rails, Philadelphia...	38.00	38.00	43.00	21.00
Carwheels, Chicago...	26.00	27.00	32.50	13.00
Carwheels, Philadelphia...	29.00	29.00	32.00	15.50
Heavy steel scrap, P'gh...	27.00	30.00	33.00	18.50
Heavy steel scrap, Phila...	25.00	25.00	30.00	16.00
Heavy steel scrap, Ch'go...	25.00	26.00	31.00	16.75
No. 1 cast, Pittsburgh...	27.00	29.00	30.00	16.00
No. 1 cast, Philadelphia...	28.00	28.00	30.00	16.00
No. 1 cast, Ch'go (net ton)	20.00	21.00	24.00	13.50
No. 1 RR. wrot, Phila...	35.00	38.00	43.00	22.00
No. 1 RR. wrot, Ch'go (net)	29.50	27.00	34.00	17.75

Coke, Connellsville, Per Net Ton at Oven:	Oct. 17, 1917.	Oct. 10, 1917.	Sept. 19, 1917.	Oct. 18, 1916.
Furnace coke, prompt...	†\$6.00	....	\$12.50	\$5.00
Furnace coke, future...	†\$ 6.00	....	8.50	3.50
Foundry coke, prompt...	....	....	13.50	3.75
Foundry coke, future...	....	....	12.00	4.00

Metals,	Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York...	23.50	23.50	26.25	28.50	
Electrolytic copper, N. Y.	23.50	23.50	26.25	28.50	
Spelter, St. Louis...	8.00	8.00	8.12 1/2	9.50	
Spelter, New York...	8.25	8.25	8.37 1/2	9.62 1/2	
Lead, St. Louis...	6.87 1/2	7.45	7.87 1/2	6.85	
Lead, New York...	7.00	7.60	8.00	7.00	
Tin, New York...	61.00	61.00	61.75	40.75	
Antimony (Asiatic), N. Y.	15.00	15.00	15.00	13.00	
Tin plate, 100-lb. box, P'gh	....	....	\$12.00	\$5.75	

have been only two sales reported amounting to about 3500 tons at the 3.25c. price, and there were some unusual conditions attached to these sales, the mills making them having had the plates in stock and anxious to move them. That buyers would take hold at the Government prices to be announced very shortly is almost certain, but the trouble may be to find producers of material willing to sell at the Government prices, as they can very readily and truthfully make the claim that their output is sold up for three to six months, and they do not care to sell at the new figure until they are in need of new orders. The makers of iron and steel pipe and boiler tubes have assured the Government that whatever prices are fixed on tubular products will be satisfactory to them and they have given assurance to the Government of their intention to get out a maximum output and also to continue to furnish to the Government its needs of pipe as promptly as it can be turned out. There have been serious declines in prices of scrap, also in ferromanganese, and it is believed that by the end of the year, or before, the whole iron and steel market will have settled down to the prices fixed by the Government, and business will be carried on at these prices. The greatest troubles that now face the iron and steel interests are the shortage in cars and labor, and especially in coal. It is admitted that the price of \$2, at mine, on coal was too low, and production has shown a very heavy falling off. Mills are unable to get coal as fast as needed and have been compelled to shut down departments for days at a time until fuel would arrive. The army draft is making serious inroads on mill organizations, and the substitution of female labor in work formerly done by males is steadily increasing.

Pig Iron.—New inquiry for pig iron continues light, the only active buyer of Bessemer and basic recently being a local steel company, which has bought 30,000 to 40,000 tons of these grades for as prompt delivery as the furnaces can make. The sales of both Bessemer and basic were made at the \$33 price for basic and

\$36.30 price for Bessemer, f.o.b. Valley furnace. The Sharon Steel Hoop Co. has also disposed of 5000 tons more of basic iron for prompt delivery at \$33 at Mary furnace, Lowellville, Ohio, and the Cambria Steel Co., which had some surplus Bessemer iron, has sold 5000 tons to a local dealer at \$36.30, Johnstown, which makes the price slightly higher, f.o.b. Pittsburgh, than if the iron was bought at Valley furnace. This iron has been re-sold to a steel company for prompt shipment. We also note a further sale of 4000 tons of basic for October delivery at \$33, Valley furnace. There have been small sales of No. 2 foundry iron at the fixed price of \$33, Valley furnace, and several of the larger makers of this grade have advised customers they will take care of their needs at the fixed price of \$33 at furnace. There has been a sale of about 2000 tons of malleable Bessemer iron for delivery at Cleveland at \$33.50 at Valley furnace. A sale of 500 tons of low phosphorus pig iron is reported to have been on the basis of very close to \$40, Valley furnace. This is the lowest price touched on low phosphorus iron for many months. It is believed there will be considerable movement in pig iron in the near future, as the feeling is prices are going to rule firm and that they will not be any lower during the near future at least.

We quote as follows: Basic pig iron, \$33; Bessemer, \$36.30; gray forge, \$32; No. 2 foundry, \$33; No. 3 foundry, \$32.50, and malleable Bessemer, \$33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—The Government price announced last week of \$47.50 on soft Bessemer and open-hearth 4-in. billets, \$51 on small billets and \$51 on sheet bars was a surprise to the trade in more ways than one. In the first place, the trade did not look for as low a price on billets as \$47.50 per gross ton, nor did it expect a differential in price of sheet bars and small billets over 4 x 4 in. billets of \$3.50 per gross ton. For years the usual spread between billets and

sheet bars has not been over \$1 per ton, and between 4 x 4 in. billets and small billets not over \$2 per ton. The fact is there have been times recently when sheet bars and billets sold at the same prices, and small billets about \$1 per ton higher than ordinary billets. So far we have not heard of any bales of sheet bars and billets at the new prices, the lowest actual sale made having been noted in this report last week, which was 1000 tons of soft open-hearth billets for prompt delivery at \$55, Pittsburgh. A rate of 1000 tons of 4x4 in. open hearth billets was made at \$50 on an old option.

Ferroalloys.—The local market is bare of new inquiry, and there has been a decided drop in prices of 80 per cent ferromanganese, both for prompt and future delivery. We now quote 80 per cent domestic ferromanganese for any delivery at \$300 per gross ton, delivered to buyer's mill. No sales have been reported in this market for several weeks. We quote 18 to 22 per cent spiegeleisen at \$70 to \$75 and 50 per cent ferrosilicon in carload lots at \$150 to \$160, delivered, lower prices being made on larger lots.

We quote 9 per cent Bessemer ferrosilicon at \$89, 10 per cent \$90, 11 per cent \$95, 12 per cent \$100, 13 per cent \$105, 14 per cent \$115, 15 per cent \$125, and 16 per cent \$135. We now quote 7 per cent silvery iron at \$79 to \$84, 8 per cent \$80 to \$85, 9 per cent \$81 to \$86, 10 per cent \$82 to \$87, 11 and 12 per cent \$83 to \$88. All prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of \$2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—Aside from Government work, very little new business is being placed in this district. The American Bridge Co. has taken 600 tons for a bridge at Washington, and the Submarine Boat Corporation is asking bids on 69,000 tons of fabricated steel needed for the construction of 50 merchant vessels for the Government recently ordered from that corporation. Local fabricators say they are not bidding actively on new work, as they are filled up for months. Prices for domestic consumption are given on page 959.

Plates.—Late last week the Government tentatively placed contracts for 30,000 4-wheel cars of small capacity for Russia, the order having been divided among the steel car companies, but later the order was cancelled, and it is now understood the Government is figuring on placing 30,000 8-wheel standard gage box cars for Russia, and this order is expected to come out at any time. Domestic railroads are not buying any new equipment. No orders for steel cars have been placed for some time, and there are no new inquiries in the market. Recently a local steel car company bought from two different mills about 3500 tons of sheared plates at 3.25c. at mill, the price fixed by the Government on Sept. 24. However, there were some unusual conditions attached to these two sales, and they cannot be taken as evidence that the plate mills are freely quoting sheared plates at 3.25c. at mill. In fact, these are the only two sales that we have yet heard of at this price. Quotations continue nominally at 8c., mill.

Steel Rails.—It is stated that no new orders are being placed for either standard rails or light rails and will not be until the Government fixes rail prices. Whether the Government will lower the price of standard sections is a question. It is regarded by the mills and railroads as a very conservative price, and may be allowed to remain undisturbed.

Sheets.—The price of \$51, f.o.b. Pittsburgh, fixed by the Government on sheet bars indicates strongly that Government prices on sheets, which are expected to come out at any time, will be somewhat lower than the Government has been paying for sheets for some months, which are based on 6.25c. for blue annealed, 6.50c. for Bessemer black, and 8.50c. for galvanized, all of 28 gage. Nearly all the new buying in sheets for a month or more has been done by the Government. The new demand from domestic consumers is dull, but specifications against contracts have been fairly active. It is known that stocks of sheets are low, and as soon as the Government announces prices an active buying movement may result. In the past two weeks the Government has placed very heavy orders for Bes-

semer black and galvanized sheets at prices noted above, and a large quantity of galvanized sheets has been bought for export for France, where war activities are in progress. Sheet mills are well sold up over the remainder of this year, but some mills are able to take orders, if they can be obtained, for fairly prompt shipments. Prices to the domestic trade on the small amount of new business being placed are holding fairly firm and are given in detail on page 959.

Tin Plate.—No announcement of the Government prices on tin plate will be made until Nov. 1, or later. In the meantime, the trade is dull, the mills not seeking new orders, and in fact have been asked not to take any obligations until the new price is fixed. The price of tin plate for last half of 1917 was \$7.50 per base box for Bessemer, and \$7.75 for open-hearth stock, but the price to be fixed by the manufacturers and the Government is expected to be somewhat lower. Some of the larger tin-plate mills will not be able to clean up contracts on their books until the end of the first quarter of next year. On small orders being placed for shipment from stock, primes bring all the way from \$10 up to \$15 per base box. Prices on terne plates, for which the demand is very dull, are given on page 959.

Hoops and Bands.—Practically no new orders are being placed, and these only for small lots for prompt shipment. Large consumers are covered over remainder of this year and into first quarter of next year. We quote steel bands in small lots at about 5c. to 5.50c., and steel hoops at 5c. to 5.50c., f.o.b. Pittsburgh. It is expected the Government prices on hoops and bands will come out this week, and will be considerably lower than the above.

Wire Rods.—The domestic demand for wire rods is dull owing to the falling off in new business in wire products, but the export demand is still heavy, and some large sales of soft rods and high carbon rods have been made for export to Canada and France, also to South America and other neutral countries. We note a domestic sale of 500 or 600 tons of soft open-hearth rods at \$83, and a sale of 550 tons of high carbon rods at \$93, f.o.b. mills. The price on rods fixed by the Government, \$57, has not been named in any sales in this district. Former prices are given on page 959.

Wire Products.—The Government has placed some heavy orders for wire nails since Oct. 10, amounting to about 30,000 kegs or more, one local mill taking 6000 kegs and another 3500 kegs. Some of these nails are for export to France for Government work, and the price was \$3.20 f.o.b. Pittsburgh. The domestic demand for wire and wire nails is dull, and specifications against contracts are only fair. The trade is looking for a lower price than \$4 on wire nails and \$4.05 on bright basic wire, and is holding off placing orders until the Government price comes out. Some in the trade believe the Government will fix a price on wire nails higher than \$3.20, which has been the price of the American Steel & Wire Co. for some months, and others in the trade believe it will be lower. Price of the independent mills on wire and wire nails to domestic consumers, and at which very little business has been actually placed, are given on page 959. Prices of the American Steel & Wire Co. are \$16 per ton lower.

Iron and Steel Bars.—Inquiries among the steel-bar mills indicate that no new orders have been taken thus far at the 2.90c. price fixed by the Government, the mills stating, when offered new business at this figure, that they are sold up on steel bars for some months and have no bars to offer. There has been very little new buying in iron and steel bars for several months, the trade being covered on contracts over the remainder of this year, and some of the large implement makers are covered into 1918. We continue to quote prices in effect on iron and steel bars for some time, as no new sales are reported at the Government price. The prices quoted on page 959 are purely nominal, and would not likely be paid by consumers on new orders.

Shafting.—It is expected the Government price on

shafting will be given out this week, but nothing is known as to whether it will be lower than the price that has been in effect for some time. Some of the shafting makers are covering their large trade for some months ahead without fixing any price, and when the Government announces the prices, they will apply on these contracts. Two of the largest automobile builders have recently contracted for their supply of shafting through the first half of 1918. New buying is dull, consumers holding off, expecting a lower market. To the domestic trade, discounts on shafting remain nominally at 10 to 5 per cent off list, prices on Government purchases being lower.

Railroad Spikes and Track Bolts.—There is a fair amount of new inquiry for railroad spikes, the Erie Railroad having an inquiry out for 1000 kegs and other roads for smaller quantities. The Government is expected to announce prices on spikes and track bolts this week, and they will likely be lower than the present market. Several large contracts for standard size spikes have lately been placed at 5c. and other smaller contracts at 5.50c. at mill. Nominal prices on railroad spikes and track bolts are given on page 959. Prices on Government orders, direct and indirect, are considerably lower.

Nuts and Bolts.—The new demand is reported fairly active, but the Government prices to be given out this week may be somewhat lower than the present market. Specifications are reported fairly active, and the Government has been a very heavy buyer of nuts and bolts for some time. Discounts are said to be firm, and are given on page 959.

Cold Rolled Strip Steel.—A meeting of cold rolled strip steel makers is being held today (Tuesday) in Chicago in connection with a meeting of the implement makers. The Government is expected to make announcement of prices on cold rolled strip steel this week, and they are likely to be lower than the figures quoted by makers for some time. The new demand is quiet, buyers expecting a lower market, but specifications against contracts are said to be fairly active.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—There is very little new buying of rivets, consumers holding off until the Government announces its prices, which will likely be this week. Nominal prices on rivets are \$5.25 for structural and \$5.35 for cone head boiler rivets, per hundred lb., f.o.b. Pittsburgh. The prices to be fixed by the Government are expected to be the considerably lower.

Wrought Pipe.—In the past two weeks, the Government has placed orders with the different mills through the sub-committee on tubular products for about 8,000 tons of steel pipe, 6 in. and smaller in size and most of it for shipment to France, for taking water to the various war buildings being erected by our Government in that country. The new demand for both iron and steel pipe is dull, buyers holding off until the Government announces its prices on both iron and steel pipe, which may possibly come out before this report reaches its readers. While nothing definite is known as to the prices the Government will fix on pipe, it is possible they will be in line with the discounts issued by some of the independent mills on May 1, last. The opinion is they may be slightly lower than the prices these discounts figure out. Mills are sold up on both iron and steel pipe over the remainder of this year and the National Tube Co. and other mills have heavy pipe obligations on their books over the first half of 1918. Discounts on iron and steel pipe as quoted by most of the independent mills from May 1, prices of the National Tube Co. being lower, were given on page 959.

Boiler Tubes.—Word is expected at any minute from the Government as to what prices it has fixed on boiler tubes and it is believed they will be very much lower than the prices in effect by most of the mills for many months past. Deliveries of both iron and steel tubes have been very hard to obtain for a long time, with the result that a mill that could make fairly prompt

delivery could get very heavy premiums in prices. As soon as the Government fixes prices, these premiums will disappear. Nominal discounts, which represent prices much below those that have actually ruled for some months, are given on page 959.

Coke.—As yet no open sales of furnace or foundry coke for prompt or future delivery have been reported this week at the prices fixed by the Government, \$6 on furnace coke, the usual differential on foundry to be allowed. It is said that different subterfuges are being tried by some operators to obtain a higher price than \$6 on furnace coke, and that prosecutions may follow if these practices are continued. One scheme tried has been to form a mythical stock company and to every purchaser of furnace coke allow him to have one share of stock at \$2.50, the other \$6 to apply on his purchase of furnace coke. This report is gossip in the trade, and is given for what it is worth. Some of the coke operators are shipping, steadily, furnace coke at \$6 per net ton at oven on open contracts made some time ago, and have not decreased the supply furnished, but on the contrary, in several cases it has been increased. The prices of \$6 on furnace coke and \$7 on foundry are still in force, subject to revision after Jan. 1. The \$1 differential in favor of foundry coke over furnace is purely tentative, and was adopted solely to allow coke operators and consumers of foundry coke to have a price on which to figure business, and is subject to revision after Jan. 1. The *Connellsville Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending Oct. 6 as 352,471 tons, an increase over the previous week of 5,063 tons.

Old Material.—Local conditions in the scrap trade are the same as noted in this report for several weeks. Consumers and dealers are waiting for word from Washington as to what the Government intends to do in the matter of regulating prices on scrap, and in the meantime consumers are not buying a pound of material, believing if the Government does fix prices on scrap, they will be much lower than what dealers regard as the market now. The only material selling is in cases where dealers have contracts for delivery of scrap prior to Nov. 1, and they are buying some heavy melting steel to ship on these contracts, if they can get cars, and are paying a little above market prices to get it. Consumers have been offered heavy steel scrap at \$28, or lower, delivered, and have turned it down. The railroads still require a permit from the shipper before a car of scrap can be moved, and also a promise from the consumer, that he will take the scrap in and unload the car promptly. This often means a delay of a week or more before a loaded car can be moved, and makes it very hard for dealers to get scrap delivered to consumers. Not enough scrap material has been sold in this market for a month or more to definitely fix prices. The prices given below, are purely nominal, but some scrap loaded on cars that had to be moved, has been sacrificed, and sold at lower prices.

Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$27.00 to \$28.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland Md., and Franklin, Pa.	31.00 to 32.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumers mill, Pittsburgh district	21.00 to 22.00
Bundled sheet stamping scrap	19.00 to 20.00
No. 1 railroad malleable stock	23.00 to 24.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
Locomotive axles, steel	48.00 to 50.00
No. 1 busheling scrap	22.00 to 23.00
Machine-shop turnings	18.00 to 19.50
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	33.00 to 34.00
*Sheet bar crop ends	33.00 to 34.00
Cast-iron borings	19.00 to 19.50
No. 1 railroad wrought scrap	30.00 to 31.00
Heavy steel axle turnings	22.00 to 23.00
Heavy breakable cast scrap	22.00 to 23.00

*Shipping point.

Cleveland

CLEVELAND, Oct. 16.

Iron Ore.—Boats are being diverted from the ore trade to the grain trade, the latter being given the first call for wild tonnage. On this account, there will probably be some falling off in October shipments. Boats are getting good dispatch and the supply of vessels seems adequate to meet the present demand for vessels for carrying ore, grain and coal. No ore sales are reported. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; old range non-Bessemer, \$5.20; Mesaba Bessemer, \$5.70; Mesaba non-Bessemer, \$5.05.

Pig Iron.—The market is fairly active after being at a stand-still for several weeks while buyers and sellers were waiting for the price regulation and fixing of differentials. The demand is largely for foundry grades in lots of 200 tons and under for this year's delivery, although there is some buying for the first half and a few sales of malleable iron are reported, including a 300-ton lot for this year's delivery. Sellers are taking orders for iron for such deliveries as they are able to fill at the Government price, \$33 for No. 2 foundry and \$33.50 for malleable. Sales for this year's delivery are being made subject to price revision should the Government change the differentials named by the Pig Iron Committee on the various grades. Orders for the first half are being booked at this year's prices without readjustment clauses in the contracts, sellers believing that should there be any price revision Jan. 1, it will be downward rather than upward. Producers are still receiving requests for readjustments of high-priced contracts. Shipping orders continue heavy. However, it will be some time before deliveries will be made on the iron sold at the maximum prices, most of the shipments at present being of iron bought at below the Government price. The Westinghouse Electric & Mfg. Co. has changed its specifications in the inquiry for iron wanted for its Cleveland plant for Government work, and now is asking for 1000 to 2500 tons of standard Bessemer iron instead of malleable iron. Southern pig iron producers are not making quotations, and it is still uncertain what their attitude will be on prices. It will be necessary for them to reduce the Government price of \$33 \$3 or \$4 a ton to meet the competition of Northern iron in the Northern Ohio territory. No quotations are being made on low phosphorus iron, as sellers have no information as to what price this iron will command under the Government regulation. We quote delivered Cleveland, as follows:

Bessemer	\$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry, nominal	37.00
Gray forge	32.30
Ohio silvery, 7 per cent silicon	44.62

Coke.—There is a great deal of inquiry for foundry coke for prompt shipment, and some inquiry for contracts, but as producers are loaded up with high-priced contracts, local sellers are unable to secure prices from producers and cannot quote on the inquiries. However, it is reported that a very few small lots of foundry coke have been picked up at \$6 per net ton at oven. Foundries are likely to suffer before long unless they are able to secure a supply of coke.

Finished Iron and Steel.—The volume of inquiry for finished products has increased, but this is largely for steel for Government work and consequently has not resulted from the fixing of prices. This demand is for various lines of finished steel for cranes, motor trucks, army wagons and other equipment. A large amount of business in axles and other truck parts is being distributed among manufacturing plants. An order for 600 tons of tire steel for army wagons has been placed and another order for several hundred tons is pending. Another order placed is for 750 tons of chrome vanadium spring steel. There are new inquiries from railroads for 4750 tons of steel for bridge work on which the Government price has been quoted, but no promise was made as to delivery except the rather indefinite one that delivery could probably be made late in 1918

subject to Government requirements. Manufacturers are finding it more difficult every day to secure steel wanted for other than Government work. A builder of heavy machinery is inquiring for 1200 tons of bars, plates and shapes for delivery in June and October, 1918. Before the announcement of prices on semi-finished steel last week, several sheet bar sales were made to Ohio mills at \$80 for prompt shipment, consumers being willing to pay the high price rather than to wait for the lower Government price and the uncertainty of delivery. The local plate market is unchanged, one mill continuing to book orders at 7.50c. While the prices fixed by the Government for semi-finished steel seem generally to give satisfaction, some objection is being made to the \$50 price fixed for slabs, it being claimed that the steel makers who are allowed \$17 for converting \$33 pig iron into slabs have an advantage over the plate mills that must sell their product at \$65 a ton, being allowed only \$15 a ton for conversion. Sheet prices have eased off and the demand has improved. Some mills are glad to fill up with orders at higher than the expected Government prices and some consumers are willing to place orders at the prevailing prices and secure deliveries rather than to wait for the lower Government prices and the possibility of delayed deliveries. Sheets are being offered at 7c., Pittsburgh, for No. 28 black and 8.50c. for galvanized, although sales are reported at as high as 8.50c. for black sheets. Galvanized sheets have been sold as low as 6c. by a consumer having a surplus stock. It is expected that the Government price on black sheets will be from 5.50c. to 6c. The demand for hard steel bars for reinforcing purposes is light and prices are not firm, the usual quotations being from 3.75c. to 4c. Warehouse prices are 4.50c. to 5c. for steel bars and 5c. to 5.25c. for structural material.

Old Material.—The scrap market is almost at a standstill. Consumers are unwilling to buy until prices are fixed by the Government, and the only trade is in small lots between dealers to cover old orders. The market is weak, prices still showing a downward tendency. There have not been enough transactions in most grades to establish prices, and quotations are still largely nominal. Some of the dealers are asking \$30 for heavy melting steel scrap but the market on this grade appears to be \$2 to \$3 a ton below that price. Busheling has declined about \$2 a ton and dealers are now offering only \$22 for this grade. Shipments to mills are very slow owing to delays in securing releases of car from the railroads. Dealers quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	\$26.00 to \$27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.00 to 28.00
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over ..	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	23.00 to 24.00
Light bundled sheet scrap	22.00 to 23.00

Per Net Ton	
Iron car axles	\$44.00 to \$45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings ..	16.00 to 16.75
No. 1 busheling	22.00 to 23.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	19.00 to 19.50
Stove plate	19.00 to 19.50

Bolts, Nuts and Rivets.—New inquiry for bolts, nuts and rivets is light. Consumers are withholding orders for a possible price reduction. While there are reports of price shading by jobbers, bolt and nut makers appear to be holding to recent prices, but if buyers can wait long enough they will probably be able to buy at lower prices. However, makers are not disposed to make concessions until they catch up somewhat on orders. Rivet prices are still apparently firm. We quote rivets at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, $\frac{3}{4}$ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer.

20. Machine bolts, with h. p. nuts, $\frac{3}{4}$ x 4 in., smaller or shorter, 40; cut thread, 35; larger and longer, 25. Large bolts, cone point, 40. Square h. p. nuts, blank, \$1.90 off list; tapped, \$1.70 off list. Hexagon, h. p. nuts, blank, \$1.70 off; tapped, \$1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, \$1.25 off; tapped, \$1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Cincinnati

CINCINNATI, Oct. 16—(By Wire).

Pig Iron.—A new southern Ohio furnace, built to produce basic for the owner's exclusive use, in its initial operation turned out over 2000 tons of iron that ran high enough in silicon to be used for foundry purposes. The bulk of this iron has been sold at a reported price of \$33, furnace. A few small lots of foundry iron from Ironton have also been disposed of at the same figure, all for this year's shipment. Southern producers have been slow in getting into line, but some furnace and resale No. 2 foundry is now on the market at \$33, Birmingham basis, with prices subject to revision to conform to the Government's schedule. Very little of this iron has been sold in this territory and the furnace offers came out only this week. It is hardly probable that there is enough iron in the South for this year's shipment, not under contract, that will prove any disturbing factor as far as contracts are concerned. A number of inquiries have been received lately for first half iron, but furnace operators are generally disposed to let that delivery take care of itself. So far, no contracts have come to light on the proposed basis of billing the iron at the Government's price at the time of shipment. It is rumored that Southern producers will recommend the adoption of the new Virginia furnace schedule of 1.75 to 2.25 per cent silicon for No. 2 foundry iron. Only a fair tonnage of Virginia foundry was sold in this territory at \$33, furnace, and sellers now state that there is very little No. 2 foundry in that district to be had for this year's movement. All selling agencies are receiving urgent requests from consumers to hurry forward iron due them on contracts. A quiet inquiry is out from a consumer in this territory for a medium sized tonnage of basic for this year's shipment. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, nominal prices, as follows:

Southern coke, No. 2 f'dry and 2 soft.....	\$33.00
Southern Ohio coke, No. 2.....	33.00
Basic, Northern.....	33.00

(By Mail)

Finished Material.—Jobbers report more inquiries, both from city and suburban customers. Orders are also more numerous but not so large as usual. Standard galvanized steel pipe is hard to obtain; a medium-sized order from a neighboring city had to be split among three houses to obtain prompt shipment. Cold rolled shafting is in good demand and so far the jobbers have been able to make prompt deliveries on nearly all orders received. It is quoted from stock at 15 per cent plus list. Prices on steel bars are somewhat irregular and as low as 4.65c. could be done on good specifications, although as high as 5c. on small shipments is quoted. Twisted steel bars take the usual advance of 5c. per 100 lb. Structural shapes are unchanged at 5.15c. to 5.25c. and plates $\frac{1}{4}$ -in. and heavier are held at 10c. A better call for No. 10 blue annealed sheets is reported and they are firm at 10c. from stock. The nominal mill quotation on No. 28 black sheets is 8.65c., Cincinnati or Newport, Ky., and on No. 28 galvanized 10.65c. All kinds of wire goods are slow and from \$3.80 to \$3.90 per keg base is quoted by jobbers on wire nails.

Coke.—New orders are as scarce as they have been in all districts for the past three weeks. Some business is being taken in Connellsville coke, but the number of cars obtained is said to be small and represents fill-in lots of foundry coke badly needed by consumers. Oven operators in the Wise County, Pocahontas and New River districts are practically unable to take more business this year and are unwilling to book orders for shipment next year.

Old Material.—The uncertain conditions surround-

ing the market make it difficult for the dealers to establish stable prices. The market is still declining, but not so rapidly as a week ago. A reduction of 50c. per ton has been made on nearly all grades, but a firm offer for a desirable tonnage would be accepted below the regular market quotations.

The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati.

Per Gross Ton	
Bundled sheet scrap.....	\$17.50 to \$18.00
Old iron rails.....	32.00 to 32.50
Relaying rails, 50 lb. and up.....	44.00 to 44.50
Rerolling steel rails.....	33.00 to 33.50
Heavy melting steel scrap.....	24.50 to 25.00
Steel rails for melting.....	24.50 to 25.00
Old carwheels.....	25.00 to 25.50

Per Net Ton	
No. 1 railroad wrought.....	\$27.50 to \$28.00
Cast borings.....	12.50 to 13.00
Steel turnings.....	12.50 to 13.00
Railroad cast.....	18.50 to 19.00
No. 1 machinery cast.....	23.50 to 24.00
Burnt scrap.....	13.00 to 13.50
Iron axles.....	40.00 to 40.50
Locomotive tires (smooth inside).....	33.50 to 34.00
Pipes and flues.....	15.50 to 16.00
Malleable cast.....	19.00 to 19.50
Railroad tank and sheet.....	14.00 to 14.50

Birmingham

BIRMINGHAM, Oct. 15.

Pig Iron.—The pig iron market in the Birmingham district is in a more or less unsettled state as regards prices, but iron makers assert that they are being pushed to meet contract requirements and they do not expect any trouble in price adjustments when the Government prices are made final. The Government price of \$33, No. 2 foundry basis, is being quoted very little here, iron producers declaring that they have nothing to offer above the make necessary to meet contractual requirements. Local producers yet are awaiting official confirmation of the prices fixed by the Government. The only information they have received has come through the press, and they declare they will not begin to make prices other than on the \$33, No. 2 foundry basis, until they have received more definite information regarding this price. Producers state that they believe there will be differentials for various furnace makes, and they desire to obtain definite information along this line before proceeding to change prices in future contracts. No news has been made public of any iron buyers making attempts to obtain release from contracts made before the Government prices became effective, and it is presumed that producers have not had to meet a situation of this sort.

Old Materials.—Prices on old material have shown no change. The effect of the Government's price fixing on pig iron is reflected in this market, and it is indicated that there will be drops in prices here. No revision has been made since last week, however. Dealers report further increase in stock on hand. Quotations are as follows:

Old steel axles.....	\$32.00 to \$33.00
Old steel rails.....	24.00 to 25.00
No. 1 wrought.....	26.00 to 27.00
Heavy melting steel.....	20.50 to 21.50
No. 1 machinery.....	23.50 to 24.50
Car wheels.....	23.00 to 24.00
Tramcar wheels.....	20.00 to 21.00
Stove plate.....	18.00 to 19.00
Shop turnings.....	11.00 to 12.00

Coal.—Coal operators are bending every effort toward speeding up production and assert that they are meeting with fair success. They believe that if they can continue to increase the production for the remainder of the month and set a standard which can be maintained there is no danger of a coal shortage.

San Francisco

SAN FRANCISCO, Oct. 13.

The distance of this market from Eastern sources of supply adds more indefiniteness to a situation already complicated since the publication of the Government scale of maximum prices for steel products. Local mills await further declarations of Government price regulation with the expectation that differentials allowing for freight and extra cost of production may be established for Coast mills. With no advice of price changes from Eastern mills,

there is no change in this market; jobbers booking orders at former ruling prices. Few orders are being booked by representatives of Eastern mills, several of whom have left for the East to consult with their houses on the situation. There is a feeling of insecurity in the trade, generally, and it is apprehended that as soon as lower priced material arrives in this market, dealers here will have to follow the Eastern lead and scale down prices. Some large buyers are holding away from the market, being undecided whether to close at present figures or to await expected lower prices.

Bars.—No orders are being booked by local mills at the Government maximum price, the mills being already overbooked and delivery uncertain. Coast sizes from local mills continue at the base prices of 4c. to 5.25c. in carload lots, f.o.b. San Francisco, but jobbers' prices exceed these, their quotations being offered at a base price of 6.50c. Demand for steel bars has fallen off during the past week owing to the unsettled condition of the steel market, and local mills are working only on existing contracts.

Structural Materials.—There is considerably more inquiry for structural shapes, although it is chiefly of a tentative nature. Engineers and architects, expecting recessions in prices, are preparing plans and estimates for clients desirous of building as soon as the Government price goes into effect. Aside from this, there is little stir in this market and few orders are being offered local fabricators. In spite, however, of a weakened demand, there has been no deviation from a base price of 7.75c., f.o.b. San Francisco, although sales exceeding this figure are announced by representatives of Eastern mills as having taken place, compelled by unusual conditions of supply and demand.

Plates.—Since the return of the machinists and ironworkers to the shipyards, after the walk-out, the demand for tankplates has improved. No new quotations are indicated by Eastern mills, and jobbers offer only at former prices. Buyers are in somewhat of a quandary. While there seems a probability of a readjustment of prices, in accordance with the Government scale, yet it is not unlikely that the embargo on shipments to Japan may be lifted, which would make uncertain deliveries.

Sheets.—Shipyards are placing some large orders for sheets, intended for additions to present buildings, or as temporary structures at new shipyards. Small orders are infrequent and bookings, as a whole, are not in such volume as formerly. Jobbers make no concessions in prices, while quotations are hard to obtain from representatives of Eastern mills. Stocks in jobbers' hands are low, and at this juncture jobbers do not feel inclined to replenish, preferring to await events.

Wrought Pipe.—Activity in the wrought pipe market has not assumed large proportions lately. Orders from the oil fields are still arriving, but not in such volume as during previous weeks. Black oil pipe, 4 in., is quoted at \$96.25 per 100 ft., f.o.b. San Francisco, with Eastern deliveries rather uncertain. The lull in building has stopped individual buying, most of the bookings coming from corporations.

Cast Iron Pipe.—There is very little tonnage offering and the market on cast iron pipe is extremely quiet. No contracts of size are offering and the usual small orders from corporations are lacking. Buyers seem diffident about entering the market and future operations depend on the adjustment of conditions in the iron and steel market. Present quotations are, for water pipe, 6 in. or larger, \$73, f.o.b. San Francisco, and gas pipe, Class A, \$77, f.o.b. San Francisco.

Pig Iron.—Most buyers free from existing long time contracts are holding back until the price situation clears. There are no quotations yet at any figures approaching the Government maximum price. Jobbers and Eastern representatives quote nothing less than \$65 a ton for No. 2, f.o.b. San Francisco. There is a feeling among some of the local mills that long term contracts for pig iron, made with Eastern corporations, may be subject to revisions by the Government, or

interpretation by the courts. Reports from the furnaces recently installed in the Northwest state that they will soon be able to supply customers with pig iron.

Coke.—There is more activity in the coke market here than has been displayed for some time. Spot stocks, in bulk, have sold lately as high as \$35 a ton and \$40 sacked, f.o.b. San Francisco. Eastern deliveries are somewhat easier and futures are quoted at \$23 to \$24 a ton, f.o.b. San Francisco.

Old Materials.—Stocks of old material are accumulating; 400 tons has arrived in the last two weeks, which, added to stocks already on hand, places the supply somewhat in excess of local requirements. Holders express confidence in a maintenance of present prices, but unless export licenses can be obtained for shipment to Japan, a drop in values seems inevitable. Selling prices during the past week have been, for heavy melting steel scrap, \$26; cast iron heavy material, \$32 to \$34; light cast iron stove plate, \$22, f.o.b. San Francisco. Country scrap is not much in request, the tendency of buyers being toward the better grades.

Buffalo

BUFFALO, Oct. 15

Pig Iron.—One furnace interest of the district reports that several sales of No. 2X foundry iron have been made during the week at \$33, furnace, in lots of 400 to 600 tons. This producer had until very recently been running one of its furnaces on ferro-silicon, but changed to foundry iron within the last week, and some of this product is now being disposed of at the above-mentioned price. Most of the furnaces of the district, however, report very little iron to sell, having practically no product uncontracted for for delivery over the remainder of the year, and are not making efforts to sell for 1918 deliveries at present. A good many users are asking if furnaces have iron to sell at Government prices, and producers state they are perfectly willing to sell such product as they have uncontracted for, for delivery at such time as they have it to dispose of, at the tentative prices that have been promulgated by the Government, subject to any changes due to governmental revision.

The price scale would, therefore, be approximately as follows, f.o.b. furnace, Buffalo:

No. 1 foundry.....	\$34.50
No. 2 X.....	33.50
No. 3 foundry.....	32.50
Gray forge.....	32.00
Malleable.....	31.50
Basic.....	33.00
Lake Superior charcoal, f.o.b. Buffalo.....	39.75

Finished Iron and Steel.—The mills and sales agencies of the district as a rule report they have practically nothing to sell, having sufficient orders on books to carry them over the remainder of the year, and are not yet entertaining the taking on of orders or contracts for the period after Jan. 1, although if quotations were made, they would be at prices prescribed by the Government. In the Canadian market, interest has been centered on the fixing of prices by the United States Government in conference with the steel makers, and similar action by the Dominion Government is looked for in price fixing and control of materials. Users of steel plates and of tin plate are greatly exercised over the embargo on these products, as it is unlikely that class C consumers will be able to get requirements filled; but so far no modification or remedy has been suggested. The John W. Cowper Co., Buffalo, has received the contract for the construction of a power house and refinery for Hydofats, Inc., Niagara Falls, an auxilliary of the Kellogg Products Co., taking 100 tons of structural steel.

Old Material.—The market is again marking time, awaiting announcement of price that the Government will fix for the different lines of scrap materials. The conference of the American Board of Scrap Dealers scheduled for Oct. 25, at the Fort Pitt Hotel, Pittsburgh, is expected to have an important bearing on the fixing of the price scale, and the general impression is that the price to be fixed by the Government will be \$30 for heavy melting steel. It is reported

that one large consumer in this district has offered \$28.00 within the past few days, but was unable to close purchases of any material tonnages at this figure. A good many large orders placed within the last month for heavy melting steel at \$35.00 to \$38.00 that call for delivery extending to Jan. 1, are being hurried forward as rapidly as possible by sellers, and dealers generally are putting all endeavors into the completion of old contracts rather than manifesting much interest in new business. Another embargo on Monessen, Pa., one of the largest consuming points, coupled with the fact that practically all outside shipping points require special permits, and the serious handicap of the scarcity of labor tend to retard and restrict shipments to a minimum. We quote dealers' asking prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	.....	\$30.00 to \$31.50
Low phosphorus	.....	41.00 to 42.00
No. 1 railroad wrought	.....	40.00 to 41.00
No. 1 railroad and machinery cast	.....	29.00 to 30.00
Iron axles	.....	45.00
Steel axles	.....	45.00
Car wheels	.....	30.00 to 31.00
Railroad malleable	.....	29.00 to 30.00
Machine shop turnings	.....	17.00 to 18.00
Heavy axle turnings	.....	26.00 to 27.00
Clean cast borings	.....	19.00 to 20.00
Iron rails	.....	40.00 to 41.00
Locomotive grate bars	.....	20.00 to 21.00
Stove plate	.....	20.00 to 21.00
Wrought pipe	.....	26.00 to 27.00
No. 1 busheling scrap	.....	25.00 to 26.00
No. 2 busheling scrap	.....	17.00 to 18.00
Bundled sheet stamping scrap	.....	19.00 to 20.00

BRITISH STEEL MARKET

Talk of Reorganization of Business Methods—All Plants Busy

LONDON, ENG., Oct. 16 (*By Cable*).

Pig iron, Cleveland, is quieter but firm. Hematite is strong, with urgent home demand. Tinplates are firm. Steel allotments have increased. Current mill output is now about 37 per cent of normal. Semi-finished is idle and unchanged. Ferromanganese is firm. Orders are pending for a large quantity for shipment in first half of 1918. North Atlantic ports sellers are asking \$350 and upward, c.i.f.

(*By Mail*)

Productive capacity in the British iron and steel industry continues fully engaged, and no efforts are spared to satisfy as far as circumstances permit the heavier calls made upon steel producers for munitions and shipbuilding material. There is, on the whole, no great change in the general situation, which is as satisfactory as could be expected, all things considered.

Greater firmness prevails in pig iron, with evidence of an enlarged demand on all sides, especially for steel-making descriptions, the position of which seems more acute, and this has necessitated a considerable number of furnaces being put on basic iron lately in the Midlands. The output of East Coast hematite is also being increased, the demand growing to such an extent as to force a restriction of the allocations to consumers. The July allocations to Italy have only just been made, and have been cut down considerably, although it is hoped that the deficit will be recouped when the applications for the next two months are dealt with. The Italian demand is greater than ever. The price to Allies remains at 141s., subject to an allowance for ore freight over the official basis. Requirements in Cleveland foundry iron are met with ease, but, with the increasing demand, stocks are hardly likely to accumulate much over the end of the year.

Semi-finished Very Tight

There is not the least sign of any alleviation of the tightness in semi-finished steel, the home output being almost entirely appropriated for Government work, but official quotations are retained as before at £10 7s. 6d. for Welsh bars and billets delivered. Shell discard billets are also being utilized for war work. There is really nothing fresh regarding American material, business being negligible in the absence of offers, though small lots of wire rods are occasionally obtainable at about £28 to £29 c.i.f. Liverpool.

Intense stringency is everywhere in evidence in finished iron and steel, and new business is restricted. The whole position is absolutely dominated by war and marine requirements.

Reorganization Discussed

The reorganization of the British steel trade is now engaging the attention of the Committee of the Iron and Steel Institute, whose report says that "It is clear to the committee that the one outstanding feature which has been revealed by their work, so far as it has gone, has been the eliciting of the almost unanimous opinion that if the steel industry in this country is to maintain its position, it must be by some great broadening of our commercial organizations that would lead to economies far and away outweighing any other element in the situation, and long ago realized and adopted by our foreign competitors. The view is held in trade circles that the industry can hardly hold its own in open competition with other steel-producing countries unless the contemplated scheme includes a central selling board under whose control orders would be allocated to the works in proportion to their capacity."

Plates and Sheets

There is virtually no change in the plate and sheet markets, which are entirely under Government control, the chief difficulty barring the way to an extension of production from the present reduced level, in the case of tinplates and galvanized sheets, being the lack of steel. Only few orders are now being booked in black sheets on the basis of the official price fixed recently of £17 1s. 0d. for close annealed No. 24 gage sheets net f.o.t. at makers' works, and it is understood that some works are now taking orders for Allied countries on the same basis, although there is some grumbling that the official basis is too low.

There is not much stirring in tinplates, but the mills have very little to sell for near months, some makers having their output already earmarked into March next. There is no special feature, the tone being firm on the official maximum basis price of 30s. per base box net at mills, although this figure is shaded to the extent of 1s. for suitable specifications in light plates. Merchant business is almost at a standstill, while export orders for Allied countries continue to be passed on direct to the works through Government channels.

Business in ferromanganese hangs fire, makers being still out of the market. There is a steady demand for Continental ports, the price asked being £80 f.o.b. for loose, while the quotation for North American Atlantic ports for far forward shipment is \$375 c.i.f. America is still inquiring.

Chicago

CHICAGO, Oct. 15.

More satisfying information, from the viewpoint of the consumer, at least, is at hand regarding the prices of foundry iron, mild and hard steel bars, and warehouse prices on plates and sheets. Pig iron has been sold, though not in large quantities, on the basis of \$33, furnace, with the understanding that the price is subject to revision should such action be justified by Government announcement more definitely placing the status of iron prices. An Eastern producer has sold in this market both mild and hard steel bars on the basis of 2.90c., Pittsburgh, the agricultural implement trade taking a limited quantity of hard bars. Less of the mild steel was disposed of, the deliveries in both cases being prompt. A large jobber to-day announced a reduction from 10c. to 7c. in the price of plates out of warehouse, while the declines in sheets varied from ½c. to 1c. The mill prices on sheets, while uncertain, are admittedly lower, with the market soft. It is generally asserted that plates and shapes are unobtainable, except for Government purposes, at the recently fixed prices of 3.25c. and 3c., although it is intimated that Eastern mills which have avoided contracts are quietly looking around for plate business. Large Western producers have no bars to offer, any more than they have

plates and shapes. At the same time, inquiry is plentiful.

The prices, fixed by agreement, on blooms and billets, slabs, sheet bars, wire rods and skelp, will not have much effect, except as they influence the general price situation, on most of the mills in this territory. Those which produce the products named can use practically all they make. It is predicted that there will be no eagerness to sell sheet bars at \$51 a gross ton, likewise with 4 x 4 in. and larger billets at \$47.50 per gross ton. The prices for shell steel are regarded as pretty low, in view of the extent to which the cost of production has increased, and it is declared, with regard to all the prices, that the cost of doing business has caused much of the profit that might be in them to disappear.

Pig Iron.—Sales have been made in the past week, for delivery this year, and in the first quarter and first half of next, on the basis of \$33, furnace, with the understanding in all cases that the price is subject to revision, if considered proper after further Government announcement is made. It is understood, however, that whatever sales are made will not be affected by any changes in official figures which may be made at the end of this year. The trade is still awaiting official notification as to basing points, also information as to differentials, but it is not assumed that any furnace will accept less than \$33 for No. 2. Further evidence of the bending of the iron market toward the \$33 level is that dealers are receiving offerings, both from furnaces and consumers, the latter having surplus stocks, which name \$33, furnace, as an acceptable price. In a small way, there is considerable inquiry, and one of the large interests is quoting where the specified deliveries are beyond next February, at which time it will have a new furnace in blast and consequently more iron to sell. So far as this year is concerned, the interest in question is sold up, therefore not quoting except where Government requirements are to be filled, but admits that \$33 would be its quotation if it could take any non-Government business. Another interest reports sales aggregating 1250 tons, at the official price of \$33, mostly, however, for delivery in other territories, although some sales were made in the Chicago district on the same basis, with a clause providing for revision of price. In one case, no price at all was arranged, tentatively or otherwise, and it is to be determined by future events. Both low phosphorus and charcoal iron are under inquiry, and prices of a tentative sort have been named, the quotations being based on the recommendations made to the War Industries Board as stated in THE IRON AGE of Oct. 11, page 915, final action on which is awaited. A company which manufactures aeroplane motors is in the market for 800 tons for delivery in the last and first quarters. The quotations below are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Northern coke foundry, No. 1.....	\$33.50
Northern coke foundry, No. 2.....	\$33.00
Northern coke foundry, No. 3.....	\$32.50
Northern high-phosphorus foundry.....	\$33.00
Southern coke No. 1 f'dry and 1 soft.....	\$53.00
Southern coke No. 2 f'dry and 2 soft.....	\$52.00
Malleable Bessemer	\$33.00
Basic	\$33.00
Low-phosphorus	\$85.00 to 90.00
Silvery, 8 per cent.....	\$77.50 to 82.50

*In accordance with the price agreed on. Sales made with revision clause.

†Not yet changed, but new prices pending. Figures shown entirely nominal.

Ferroalloys.—No change in 80 per cent ferromanganese is reported, \$325 being quoted for the remainder of this year or first quarter of next.

Plates.—The Government continues to place orders for plates required for tank work, and for ships to be built for the Emergency Ship Corporation, although the quantities placed with one large local independent mill are not notable as to size. To private buyers quotations are not being made by local producers, the mills insisting they cannot take any business not connected with Government work, but it is reported that

one or two Eastern makers are beginning to become somewhat anxious for orders inasmuch as they have avoided the making of contracts and largely confined their bookings to prompt deliveries at the high prices which have prevailed. In a general way, the domestic consumer of plates and shapes is in a worse way than he was before the official prices of 3.25c. and 3c. were named. Chicago jobbing warehouses to-day dropped their price on plates from 10c. to 7c.

For Chicago delivery out of stock jobbers quote 7c.

Shapes.—Except for Government business, it does not appear that 3c., Pittsburgh, has been done. All of the producers and their representatives say they have none to offer for delivery this year, while circumstances make them unwilling to sell into the future. The requirements of the Emergency Fleet Corporation continue to be cared for. No structural lettings were announced this week. Jobbers announce no change in their price.

For material out of warehouse the quotation is 5c.

Bars.—An Eastern producer which had a limited quantity of mild and hard steel bars to dispose of for prompt delivery placed them quickly at 2.90c., Pittsburgh, and could have sold a much larger tonnage had it been available. The rail carbon bars were taken by the agricultural implement trade. The mild steel bars did not involve a large tonnage. Other makers of rail carbon bars report no sales for the reason that they are booked to capacity. They say they have had no reason to change their previously quoted price of 4.25c. to 4.50c., Chicago. A little business has been done in iron bars at 4.50c., Chicago. Warehouse prices are unchanged.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes 1½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—With an announcement regulating the prices of sheets unquestionably near, not much business has been done and the market has shown pronounced weakness. It is difficult to name exact prices, but a leading maker puts the minimum of No. 28 black and No. 10 blue annealed at about 6.50c., Pittsburgh, or 6.689c., Chicago. The makers profess not to know at what figure No. 28 galvanized should be quoted, and 9.689c., Chicago, is repeated as a nominal quotation. Another meeting to consider the sheet situation is to be held in Pittsburgh to-morrow. Jobbers have dropped their quotations ½c. on blue annealed, ¾c. on black and 1c. on galvanized.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.25c.; and No. 28 galvanized, 10.50c.

Wire Products.—The leading interest continues to follow its course of recent weeks, taking business on the basis of \$3.20 for nails, but not looking for new customers. The independent makers continue to quote on the basis of \$4. In connection with the newly fixed price of \$57, Pittsburgh, per gross ton for wire rods, a local maker states that it was recently offered \$80, and that inasmuch as it can use all it produces, it does not expect to offer any to the public at the new price. We quote wire products on the basis of \$4 for nails per 100 lb. to jobbers, as follows:

Plain fence wire, Nos. 6 to 9, base, \$4.189; wire nails, \$4.189; painted barb wire, \$4.339; galvanized barb wire, \$5.039; polished staples, \$4.339; galvanized staples, \$5.039; all Chicago carload lots.

Rails and Track Supplies.—So far as can be learned, the market in these products is dormant. We quote nominal prices as follows:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, \$70 to \$90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, \$38, base (nominal); open hearth, \$40 (nominal); light rails, 25 to 45 lb., \$70; 16 to 20 lb., \$71; 12 lb., \$72; 8 lb., \$73; angle bars, 3.25c., base.

Bolts and Nuts.—With producers the situation is but little changed, consumers awaiting governmental action that will be to their advantage. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 959.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to $\frac{3}{4}$ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to $\frac{3}{4}$ x 6 in., 40-2 $\frac{1}{2}$; larger sizes, 30-5; hot pressed nuts, square, \$2, and hexagon \$2 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Contractors are expected to let 300 tons at Berwyn, Ill., to-morrow, and 850 tons at Gross Point, Ill., Oct. 17. Makers' quotations are unchanged at the reduced prices announced a week or more ago. They are looking for orders to be filled this year.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., \$53.50; 6 in. and larger, \$50.50, with \$1 extra for class A water pipe and gas pipe.

Old Material.—The market is quiet and to a large extent devoid of feature, except that there is evidence of influences which tend to steady prices. Business in several items has been done, notably turnings, railroad wrought, busheling and pipes and flues and short lengths of old rails. Incidental to the confusion and uncertainty which followed the first announcement of official prices for a few products, the quotation for old steel rails, less than three feet, given in THE IRON AGE of Oct. 4 was too low. Later information justifies \$35 to \$36, instead of \$29 to \$30 which was printed. Fair sized lists have been issued by the Big Four and Union Pacific and smaller ones by the Monon Route, C. & E. I. and Soo lines. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$36.00 to \$37.00
Relaying rails	50.00 to 55.00
Old carwheels	26.00 to 27.00
Old steel rails, rerolling	34.00 to 35.00
Old steel rails, less than 3 ft.	33.00 to 34.00
Heavy melting steel scrap	25.00 to 26.00
Frogs, switches and guards, cut apart	25.00 to 26.00
Shoveling steel	22.50 to 23.00
Steel axle turnings	19.00 to 20.00

Per Net Ton	
Iron angles and splice bars	\$34.00 to \$35.00
Iron arch bars and transoms	36.00 to 37.00
Steel angle bars	24.00 to 25.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	29.50 to 30.00
No. 2 railroad wrought	26.50 to 27.50
Cut forge	25.00 to 26.00
Pipes and flues	18.00 to 19.00
No. 1 busheling	20.00 to 21.00
No. 2 busheling	14.00 to 15.00
Steel knuckles and couplers	29.00 to 30.00
Steel springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	17.00 to 18.00
Boiler punchings	30.00 to 31.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	15.00 to 15.50
Cast borings	14.00 to 15.00
No. 1 cast scrap	20.00 to 21.00
Stove plate and light cast scrap	15.50 to 16.50
Grate bars	14.00 to 15.00
Brake shoes	14.00 to 15.00
Railroad malleable	25.00 to 26.00
Agricultural malleable	20.00 to 21.00
Country mixed scrap	15.50 to 16.00

Philadelphia

PHILADELPHIA, Oct. 16.

Announcement of agreed prices on billets, slabs, wire rods, sheet bars, shell bars and skelp by the President has caused scarcely a ripple in this market, and no business in these products is reported. However, the inactivity which has prevailed in plates, shapes and steel bars since prices were fixed has been broken to a slight extent by mills which have accepted orders for delivery over the remainder of this year and first quarter of next year from favored customers, such, for example, as the railroads. In the aggregate, several thousand tons in the three products named have been accepted without Government priority certificates at the fixed price. Despite the fact that most of the mills do not need and are not encouraging business for this year, the feeling is becoming more general that comparatively soon there will be tonnage offered for delivery next year. Exporters are not finding it difficult to locate mills willing to accept orders for fairly prompt delivery at 6c. to 8c. for tank plates, 4.50c. for steel bars, and about the same price for shapes. Such sales, of course, are for other than war purposes. There are reports that material bought for export at these prices has been resold in this country, but they lack confirmation.

A leading pig-iron seller has opened its books for any delivery, though admitting its inability to take much tonnage for this year. Several sales of basic iron, aggregating 20,000 tons, have been made during the week at \$33, furnace, of which several thousand tons are for delivery in 1918. Gray forge has been sold at \$32, furnace, Bessemer at \$36.30, furnace, and several grades of foundry iron at the differentials recommended to the War Industries Board, subject to revision if necessary. The committee considering price fixing on iron and steel scrap is reported to have discussed \$25 and \$27.30 per ton as a price for heavy melting steel.

Pig Iron.—Although there has been no announcement from Washington regarding the differentials to be established on grades of pig iron other than \$33, base, for foundry (1.75 to 2.25 per cent silicon) and basic, a leading seller of eastern Pennsylvania iron this week announced it had opened its books for orders for any delivery, which means largely next year, as there is very little iron available for delivery this year. This seller has taken a number of orders for foundry grades based on the tentative prices of \$33, furnace, for iron 1.75 to 2.25 per cent silicon, \$33.50 for 2.25 to 2.75 per cent silicon, and \$34.50 for 2.75 to 3.25 per cent silicon. These orders will be revised to meet any changes the War Industries Board may make in the schedule recommended by the pig-iron producers. It is contended here that makers may safely take contracts for next year's delivery at the new prices, and that such contracts cannot be altered in the event of a Government price revision on or about Jan. 1. A contract is declared to be as inviolable under these conditions as were existing contracts when the new prices were announced on Sept. 24. A factor that may deter some sellers from accepting much tonnage for next year is their inability to foresee what the coke situation will be. Scarcity of coke is already a serious problem, and at least one furnace in eastern Pennsylvania will go out of blast this week for lack of a sufficient supply. Furnace operators are calling on the Fuel Administration at Washington for coal and coke to avert complete shutdowns. Under the gradings of foundry iron, based on silicon content, as recommended by makers, there will be an effort to establish some uniformity of trade designations throughout the country. In the East, 2X iron has in the past been sold in competition with No. 2 foundry from Southern furnaces, though the latter was lower in silicon content. The term No. 2 plain may now be dropped, and called No. 2 foundry, its silicon content being 1.75 to 2.25 per cent, while 2X iron, as sold in the East, will be understood to mean iron containing 2.25 to 2.75 per cent silicon. Pig-iron sellers seem to be well satisfied with the new method of quoting prices only at furnace. Under present conditions there is not likely to be any attempt to equalize freight charges from different points. As an instance of the new condition, a Virginia furnace has sold 5000 tons of foundry iron, containing 3.25 to 3.75 per cent silicon, at \$35.50, furnace, of which 1800 tons going to New England took a \$3.25 per ton freight rate above the furnace price. A sale of 400 tons of foundry grades and 200 tons of Bessemer has been made for export to the Italian Government at the agreed price. Other lots sold include 1000 tons of gray forge at \$32, 200 tons of Bessemer at \$36.30, and a few hundred tons of foundry iron, 2.75 to 3.25 per cent silicon, at \$34.50. The Norfolk & Western Railroad has had an embargo on pig-iron shipments in effect for 10 days, and it may last two weeks more, preventing Virginia furnaces on that road from making deliveries. No exception is made by the railroad except for Government navy yards or arsenals.

We quote the following tentative prices at furnace (freight rate to destination must be added):

Eastern Penna. No. 2 X	\$33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	\$33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	\$32.00
Bessemer	\$36.30

*Subject to revision.

Coke.—Sales of coke have come to a dead stop and selling agents who would like to help out regular cus-

tomers with a few cars have been unable to do so. Blast furnaces are facing a serious shortage.

Ferroalloys.—Fear of price regulation has greatly weakened the market for ferromanganese, and though there have been no known sales in this market in the past week, it is reported that makers would sell at \$300 or less. Spiegeleisen is also weaker, \$70 to \$72, furnace being quoted, with a possibility that \$68 could be done.

Rails.—The American International Shipbuilding Corporation is in the market for 6700 tons of 85-lb. rails and 160 tons of 60-lb. rails for its ship plant at Hog Island, near Philadelphia. The Submarine Boat Corporation has recently closed for a fair tonnage for its new ship plant near Newark.

Sheets.—The Government has given out a number of good sized orders for sheets on behalf of the Italian Government, agreeing to furnish the sheet bars. The price is to be as fixed by the War Industries Board. Small sales have been made here for prompt delivery at about 7c. to 8c., Pittsburgh, for No. 10 blue annealed and No. 28 black and 9c. to 9.75c. for No. 28 galvanized.

Structural Material.—The Stone & Webster Engineering Corporation, Boston, has asked fabricators in this district to bid on 10 more buildings, each requiring about 450 tons of steel, to be erected in France for the United States Government. The Government will require about 1000 tons for a radio station on the Atlantic Coast. Some business has been placed at the agreed price by favored customers.

Plates.—It is reported that orders for export have been accepted at 6c. to 8c. for tank plates. In some instances, it is rumored such plates have been resold for domestic use. A few good domestic customers have succeeded in getting orders for this year and first quarter of next year accepted at the new price of 3.25c., Pittsburgh, but the average buyer would find it difficult to place business. The opinion prevails in some quarters that before long some plate tonnage for next year delivery will be offered.

Iron and Steel Bars.—Several fairly large tonnages of bar iron have been taken at 4.25c., Pittsburgh. Very little is being done in steel bars, though a few thousand tons for export have been sold at 4.50c. Several mills are filled up with orders for shell steel for England. We quote 2.90c., Pittsburgh, base, for steel bars.

Billets, Slabs, etc.—No business has been placed here for billets, slabs, sheet bars, wire rods or skelp at the new prices announced by President Wilson.

Old Material.—Regulation of shipments of old material by a permit system, as recently inaugurated by the Pennsylvania Railroad, will probably be extended soon to a large number of other railroads in the East, and may eventually become nation-wide. The New York, New Haven & Hartford Railroad now requires that application be made to its offices at New Haven, Conn., for permits to move scrap material over its lines. Heretofore it has been possible to obtain permits from the Pennsylvania Railroad for shipments originating on other roads. Dealers in iron and steel scrap in this market look for tighter restrictions on shipments to come during the winter months, and they are advising mills to make their purchases now. Apparently mills are not heeding this advice, as very little business is coming out, consumers evidently preferring to await the outcome of reported price fixing. Price fixing on scrap presents some problems not encountered with pig iron and manufactured steel products. Washington will be warned not to fix prices too low, as was at first done in England, with the result that the movement of scrap from the small dealers to the large yards was almost completely checked. Nothing official has been heard from Washington regarding the discussions on scrap price fixing, but rumors in the trade mention two prices, \$25 and \$27.30 per ton, as having been considered tentatively for heavy melting steel. It is said that all of the more important old materials will be put under price regulation, though dealers maintain that such regulation is not needed, and that a proper differential between the new prices of pig iron and scrap material now exists. The question of brokerage commissions must be decided in connection with a price fixing program. C. A. Barnes, 509 Widener

Building, Philadelphia, secretary of the American Board of Scrap Dealers, has called a meeting of that organization for Thursday, Oct. 25, 1 p.m., at the Hotel Fort Pitt, Pittsburgh, to consider price fixing and formulate recommendations to be presented to the Government. Sales of heavy melting steel have been made during the week at \$26. Two mills are offering \$25 per ton. There has been a good demand for No. 1 forge fire and bundled sheets, with a marking up in price of about \$1 per ton. No. 1 railroad wrought has declined about \$3 per ton. We quote the following price for delivery in the Philadelphia district:

No. 1 heavy melting steel.....	\$25.00 to \$28.00
Steel rails, re-rolling.....	30.00 to 35.00
Low phosphorus heavy melting.....	38.00 to 40.00
Old iron rails.....	38.00 to 40.00
Old carwheels.....	29.00 to 31.00
No. 1 railroad wrought.....	35.00 to 40.00
No. 1 forge fire.....	22.00 to 23.00
Bundled sheets.....	22.00 to 23.00
No. 2 busheling.....	15.00 to 16.00
Machine shop turnings (for blast furnace use).....	15.00 to 16.00
Machine shop turnings (for rolling mill use).....	18.00 to 20.00
Cast borings (for blast furnace use).....	15.00 to 16.00
Cast borings (clean).....	19.00 to 20.00
No. 1 cast.....	28.00 to 30.00
Grate bars.....	19.00 to 20.00
Stove plate.....	19.00 to 20.00
Railroad malleable.....	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications).....	28.00 to 30.00

St. Louis

ST. LOUIS, Oct. 15.

Old Material.—The market remains unsettled. Nothing is being done on which to base quotations and in consequence figures given below are only estimates of value. Because of the difficulty in getting cars, prices are, perhaps, a little stronger, due to needs of local consumers who can be served quickly. Some offerings are appearing from day to day from the railroads, which, however, are declining to guarantee any special type of car for shipping such material as may be taken. The only list of importance out is one of 1500 tons from the Missouri, Kansas & Texas. We quote dealers' prices, with the reservation above given, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails.....	\$36.00 to \$37.00
Old steel rails, re-rolling.....	35.00 to 35.50
Old steel rails, less than 3 ft.....	29.00 to 30.00
Relaying rails, standard section, subject to inspection.....	50.00 to 55.00
Old car wheels.....	24.00 to 25.00
No. 1 railroad heavy melting steel scrap.....	25.00 to 25.50
Heavy shoveling steel.....	22.00 to 23.50
Ordinary shoveling steel.....	19.50 to 20.00
Frogs, switches and guards cut apart.....	24.50 to 25.00
Ordinary bundled sheet scrap.....	16.00 to 16.50
Heavy axle and tire turnings.....	16.50 to 17.00

Per Net Ton

Iron angle bars.....	\$33.50 to \$34.00
Steel angle bars.....	23.50 to 24.00
Iron car axles.....	39.50 to 40.00
Steel car axles.....	38.50 to 39.00
Wrought arch bars and transoms.....	37.50 to 38.00
No. 1 railroad wrought.....	28.50 to 29.00
No. 2 railroad wrought.....	26.50 to 27.00
Railroad springs.....	25.50 to 26.00
Steel couplers and knuckles.....	27.50 to 28.00
Locomotive tires, 42 in. and over, smooth inside.....	29.50 to 30.00
No. 1 dealers' forge.....	18.00 to 18.50
Cast iron borings.....	14.00 to 15.00
No. 1 busheling.....	20.50 to 21.00
No. 1 boilers, cut to sheets and rings.....	16.50 to 17.00
No. 1 railroad cast scrap.....	18.50 to 19.00
Stove plate and light cast scrap.....	16.50 to 17.00
Railroad malleable.....	25.50 to 26.00
Agricultural malleable.....	18.50 to 19.00
Pipes and flues.....	18.50 to 19.00
Heavy railroad sheet and tank scrap.....	15.50 to 16.00
Railroad grate bars.....	15.00 to 15.50
Machine shop turnings.....	14.50 to 15.00
Country mixed scrap.....	14.50 to 15.00

Pig Iron.—The flood of small inquiries continues. The demand is for last quarter and first quarter and comes from points which have never sought material from St. Louis, many concerns scarcely known to the local trade appearing. The inquiry reported last week for 20,000 tons of basic is still unfilled, the replies from the furnaces being unanimous that no quotations could be made nor would contracts be entered into that would be subject to the establishment of market differentials by the Government. Some few sales were made of small lots of Ohio and Virginia iron on the basis of \$33, Pittsburgh, for 1.75 per cent to 2.25 per

cent silicon with an increase of 50c. per half unit for silicon in excess of that of base grade. Representatives here are being crowded for the delivery of pig iron under contract. Melters generally are approaching a need of iron, and the settlement of the price situation will be of material benefit in many ways.

Coke.—The coke situation is much the same as that of pig iron and no contracts are being made.

Finished Iron and Steel.—Deliveries are becoming more extended each day, while mill representatives are postponing the consideration of contracts. Bars are being specified heavily, but delivery is set for the third quarter of 1918. One new inquiry in the market is for 1000 tons of piling for use in Kansas City territory. Stock in warehouse has been marked down during the week and is now quoted as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 7.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled one pass, 9.25c.; No. 28 galvanized sheets, black sheet gage, 10.50c.

New York

NEW YORK, Oct. 17.

Pig Iron.—Pig iron sellers have been disposing of fair tonnages, the quotations being on a basis of \$33, furnace, for iron analyzing 1.75 to 2.25 per cent silicon and with the stipulation that the differentials to be established by agreement of the Government and manufacturers will be adhered to. Whenever furnaces have gone into the market, they have found buyers quick to place orders, and all the furnaces which have been selling could probably have sold more, but they have been very conservative, and several, notably in Virginia, have retired from the market for the present. Indications are that while melters are pretty well covered for the remainder of the year, there will be no surplus of iron, and the present condition may be described as strong. The recommendations as to differentials and other matters submitted to Washington last week have not yet been acted upon. For early delivery we quote as follows, tidewater, on those grades on which prices have been fairly established, omitting other grades for the present:

No. 1 X.....	\$34.75
No. 2 X.....	33.75
No. 3 plain	32.75

Ferroalloys.—Domestic ferromanganese is lower again. The drop of \$50 per ton, recorded last week, has been followed by a decline since then of \$25 per ton. Carload and small lots for delivery this year have sold at \$275, which is also being quoted for delivery next year. Sales have also been made at \$290. Inquiry is not large and the market is generally quiet. Receipts in September are indicated as having been larger than for any month since May inclusive, exceeding 3000 tons, which compares with an average of 2220 tons per month for May to August inclusive. Prospects for a maintenance of this rate are not bright, reports indicating that licenses for shipment from England are diminishing at an unsatisfactory rate. The large manganese ore imports, referred to elsewhere, are encouraging. Spiegeleisen, 20 per cent, has sold as low as \$75, furnace, in the past, and with some unconfirmed reports that \$72 has been done. Demand is not large. Ferrosilicon, 50 per cent, is quiet with sales of small lots for this year's delivery having been made at \$190 to \$200. For next year \$150 to \$165 is being asked, with some sales recorded at the lower figure.

Structural Material.—The fact that the fixed prices have as yet had no influence on new contracting is indicated in the report of the Bridge Builders and Structural Society to the effect that about 52,000 tons measures the volume of business done throughout the country in September, compared with 68,500 tons the month preceding and 75,000 tons in July. Good bookings are, however, expected shortly growing out of the ship-building work, but with steel about the only item entering into building construction on which lower than recent prices may be expected, general building activity seems still to be of the future. No business at 3c. for

the general buyer is yet to be noted, but one mill is willing to quote on this basis for limited tonnages, with deliveries in about three months. No new projects apparently have been awarded and to the recently published lists of fabricated structures under consideration may be mentioned 600 tons for a power house and machine shop for the Government at New London; 500 tons for the American Smelting & Refining Co., Utah, and 150 tons for the Chesapeake & Ohio, Huntington division. We quote mill shipment of limited amounts in three months at 3.195c., New York, and out of store, 5c. to 5.50c., New York.

Plates.—It appears that all of 30,000 cars will be bought for the Russian railroads, with the contracts substantially awarded at this writing, and business will soon be consummated on 10,000 cars for French railroads. A case is learned of a round tonnage of plates being offered at 3.25c., Pittsburgh, but of narrow sizes. Against this are rumors of a plan to get a mill to roll a large tonnage of ingots into plates to be sold for prompt delivery at a premium, with small likelihood, however, that a mill can be found to consider the proposition. It is also stated that a small plate mill has shut down, owing to inability to make a profit at the established price, but it is not expected that in the Government plan to secure 100 per cent production idleness will long be allowed, if indeed there is not some other reason than profit consideration for the reported action. Surprise is expressed at the success of one buyer to secure licenses on plates to be shipped to the Pacific coast to go in storage against release for export; the railroad is to refund the difference between domestic and export freight rates when the plates leave the country. While the fixed price for plates is 3.25c., fresh business to the public at this figure has not been learned of and the quotation is thus nominal. Out of store we quote plates at 8c. and higher, with some reduction in quantities by the jobber before sales are effected.

Iron and Steel Bars.—No notable change in the situation appears to have occurred. The fixed price of 2.90c. is as yet nominal so far as information concerning sales to the public are concerned, but bar iron business is still done at 4.75c., Pittsburgh, or 4.94c., New York, with warehouse business at 5c. to 5.50c. for iron and steel bars in reduced quantities.

Old Material.—The scrap market continues to drag and steel scrap particularly is weak with a tendency downward. There is some demand for car wheels, but very little interest is being shown in other kinds of steel scrap. Machinery cast has shown some improvement and No. 1 has been sold at higher prices. Railroad conditions do not improve, and complaints are numerous that there is no satisfaction in transacting business on account of the difficulty in obtaining cars. In some cases, dealers report that scrap which has been purchased has been held for several weeks awaiting cars. We quote prices of brokers as follows to New York producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)....	\$23.50 to \$24.00
Old steel rails (short lengths) or equivalent heavy steel scrap.....	23.50 to 24.00
Relaying rails	45.00 to 50.00
Re-rolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap.....	27.00 to 28.00
No. 1 yard wrought long.....	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings.....	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)....	25.00 to 26.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast.....	\$24.50 to \$26.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	16.00 to 17.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad).....	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast-Iron Pipe.—In sympathy with the lower prices

of pig iron, the quotations on cast-iron pipe have been reduced \$9 per ton and \$56.50 is now quoted on 6-in. and heavier and \$59.50 on 4-in. Still lower prices are made to the Government. No business of importance is pending either for private demand or municipalities.

BETHLEHEM SHIPBUILDING CO.

New Organization to Increase Efficiency of Operations

The organization of the Bethlehem Shipbuilding Co., Bethlehem, Pa., will bring together into one large merger the several shipbuilding interests controlled by the Bethlehem Steel Corporation. The component parts of the new organization are the Fore River Shipbuilding Corporation, Quincy, Mass.; Harlan & Hollingsworth Corporation, Wilmington, Del.; Samuel L. Moore & Sons Corporation, Elizabeth, N. J.; the Union Iron Works Co. and the Union Iron Works Dry Docks Co., San Francisco; and the shipyard now operated by the Bethlehem Corporation at Sparrows Point, Md.

E. G. Grace, head of the Bethlehem Steel Corporation, is to be president of the new corporation, which will be formed under the laws of Delaware. The executive head of the Bethlehem Shipbuilding Company will be Joseph W. Powell, president of the Fore River Shipbuilding Corporation, who becomes vice-president of the new company. Mr. Powell, who is barely 40 years old, and looks like a man of 30, has had a rapid rise in the ranks of the Bethlehem Steel Co. He has a notable Spanish War record, for while he was a cadet on the battleship New York he was in charge of the steam launch which followed Hobson on the Merrimac right up to the mouth of San Diego Harbor, on the night when the Merrimac was sunk to block the egress of the Spanish fleet. Hobson's book, "The Sinking of the Merrimac," tells of the important role that Powell played in the affair. He resigned from the Navy in 1906 to take up naval construction at the Cramp shipbuilding yard in Philadelphia. While there he attracted the attention of Charles M. Schwab. In the few years that he has been in charge of the Fore River plant he has become the most notable figure in the American shipbuilding industry. Mr. Powell has won a reputation as a hard worker, and it has been his custom to punch the time clock at seven o'clock in the morning, like any of the men in his employ. No small part of his success has been due to his popularity with the thousands of men who worked under him.

H. S. Snyder, vice-president of Bethlehem Steel Co., will be vice-president in charge of finances of both the shipbuilding company and the steel corporation as well.

Several of Mr. Powell's lieutenants who have helped to establish the success of the Fore River organization, will go to Bethlehem as his aids. Among these will be Vice-President and General Manager H. Gerrish Smith; Vice-President Harry Brown; Treasurer E. B. Hill, and Joseph Larkin of the service department.

S. W. Wakeman the present general superintendent of the Fore River plant, succeeds Mr. Powell with the title of manager. Mr. Wakeman was born in Bridgeport, Conn., and worked his way through Cornell, finding employment in shops in and near Bridgeport during his vacations. He specialized in marine work. He rowed in the Cornell varsity crew, 1897-8, and first met Mr. Powell when the latter was a member of an Annapolis crew that competed with Cornell. Mr. Wakeman's first connection, after leaving college, was with the Newport News Ship Building & Dry Dock Co. For 14 years he was with the New York Ship Building Co., becoming assistant to the general manager. The first of this year he became general superintendent at Fore River.

Joseph P. Kennedy, president Columbia Trust Company, Boston, has resigned his position to become assistant manager of the Fore River plant.

The formation of the new company was brought about after a consultation with the Navy Department for the purpose of expediting the construction of ships.

The formal announcement in part says "The demands of the Government on the facilities of the shipbuilding plants will make it essential that all duplications of engineering and similar overhead work shall be avoided so far as is possible and the proposed consolidation is expected, through the resulting standardization and the centralization of management, to increase the production of the yards affected—a result of vital importance in this time of insistent demand for expedition in the building of ships. There will be no radical departure at this time from the present operating methods at these plants, except that the sales, purchases, accounting, collections and payments for all shipbuilding operations will hereafter be made or done at or from Bethlehem."

American Iron and Steel Institute at Cincinnati

The following is a tentative list of papers to be read at the thirteenth general meeting of the American Iron and Steel Institute, to be held at Cincinnati, Oct. 26:

President's Address. Elbert H. Gary, chairman, United States Steel Corporation, New York.

Cincinnati and Its Industries. Daniel B. Meacham, partner, Rogers, Brown & Co., Cincinnati.

Recent Installations of Large Electric Motors in Rolling Mills. S. S. Wales, electrical engineer, Carnegie Steel Co., Pittsburgh.

Iron and Steel Scrap. W. Vernon Phillips, F. R. Phillips & Sons Co., Philadelphia.

The History of Iron and Steel Manufacture in Ohio. Joseph G. Butler, Jr., vice-president, Brier Hill Steel Co., Youngstown, Ohio.

Malleable Iron and Its Uses. Henry F. Pope, president, National Malleable Castings Co., Cleveland.

A Paper on a Commercial Subject. Eugene P. Thomas, president, United States Steel Products Co., New York.

Discussion of each paper under the five-minute rule will be welcomed.

Entertainment, provided by the Cincinnati Committee and the Chamber of Commerce, will take up all of the second day, Oct. 27. The morning will be devoted to an automobile tour of the city, ending with a luncheon at the Grandin Road Country Club. The afternoon will be divided between three diversions—golf, the races at Latonia, and inspection of the art gallery of Charles P. Taft.

Railroad Equipment Demand

A demand for railroad equipment beyond general estimates was hinted at by William C. Redfield, Secretary of Commerce, in an address which he made before a conference of editors of the business press at New York on Oct. 16. Speaking of the stipulations of the trading with the enemy act, he told how on top of the demands for merchant and navy shipbuilding is to be reckoned a railroad demand which will perhaps result in our making up in construction abroad what we have not been doing in the United States. Following the contracting for the 1200 miles of railroad in France for the United States Government, complete in road bed, rolling stock and buildings, the statement seems already substantiated by reports that fully 30,000 cars are to be supplied by the Government to Russia, to be operated by railroad men selected from this country, and 10,000 cars are about to be supplied to French railroads.

The Defiance Screw Machine Products Co., Defiance, Ohio, specialist in large screw machine work, is building a two-story addition to its plant, the steel to be furnished by the Toledo Bridge & Iron Co., Toledo, Ohio. The company states it has on hand all the equipment needed for the additions, and will not be in the market for any machinery. The enlargement of this plant is made necessary by the steady growth of its business.

The Iroquois Iron Co., South Chicago, expects that its new furnace, No. 5, now building, will go into blast about Feb. 15, 1918. The company is considering inquiry for delivery after next February, in view of the expected increase in production.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Nominal quotations, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c., minimum carload 36,000 lb.; St. Paul 35.5c., minimum carload 36,000 lb.; Denver 79c., minimum carload 36,000 lb.; Omaha 47c., minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c., minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c., minimum carload 40,000 lb. and 85c., minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and tees 3 in. and over, 4c.

Wire Products

(Prices of independent mills)

Wire nails, \$4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.95; galvanized wire, \$4.65; galvanized barb wire, and fence staples, \$4.85; painted barb wire, \$4.15; polished fence staples, \$4.15; cement-coated nails, \$3.90 base these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent off for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2 1/2 per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, \$1.70 off list, and tapped, \$1.50 off; hex. blank, \$1.50 off, and tapped, \$1.30 off; nuts, c. p. c. and t. sq. blank, \$1.25 off; and tapped, \$1 off; hex. blank, \$1.25 off, and tapped, \$1 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at \$83 to \$85; high-carbon rods made from ordinary open-hearth steel, \$95 to \$100, and special steel rods with carbons running from 0.40 to 0.60, \$100 to \$110 at mill; above 0.60 carbon, \$115 to \$120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, \$5 to \$5.50; 3/4 in., 7/16 in. and 1/2 in., \$7.00 base. Boat spikes are occasionally quoted \$7 to \$8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., \$75 to \$80; 16 to 20 lb., \$80 to \$81; 12 and 14 lb., \$82 to \$83; 8 and 10 lb., \$83 to \$84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, \$38; open hearth, \$40 per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from \$2 to \$2.50 per package and are now as follows: 8-lb. coating, 200 lb., \$16 per package; 8-lb. coating, I. C., \$16.30; 12-lb. coating, I. C., \$17.50; 15-lb. coating, I. C., \$18.25; 20-lb. coating, I. C., \$19; 25-lb. coating, I. C., \$20; 30-lb. coating, I. C., \$21; 35-lb. coating, I. C., \$22; 40-lb. coating, I. C., \$23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1/4, 1/2 and 3/4	42	15 1/2	1/4 and 1/2	23	+4
1/2	46	31 1/2	3/4	24	+3
3/4 to 3	49	35 1/2	1/2	28	10
			3/4 to 1 1/2	33	17
Lap Weld			Lap Weld		
2	42	29 1/2	2	26	12
2 1/2 to 6	45	32 1/2	2 1/2 to 6	8	15
7 to 12	42	28 1/2	7 to 12	25	12
13 and 14	32 1/2	..			
15	30	..			
Butt Weld, extra strong, plain ends			Butt Weld, extra strong, plain ends		
1/4, 1/2 and 3/4	38	20 1/2	1/4, 1/2 and 3/4	22	6
1/2	43	30 1/2	1/2	27	14
3/4 to 1 1/2	47	34 1/2	3/4 to 1 1/2	33	18
2 to 3	48	35 1/2			
Lap Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends		
2	40	28 1/2	2	27	14
2 1/2 to 4	43	31 1/2	2 1/2 to 4	29	17
4 to 6	42	30 1/2	4 1/2 to 6	28	16
7 to 8	38	24 1/2	7 to 8	20	8
9 to 12	33	19 1/2	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5 1/2 points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel	Standard Charcoal Iron
1 1/2 and 2 in.....31	1 1/2 in.....23
2 1/2 in.....28	2 in.....25
3 in.....34	2 1/2 in.....32
3 1/2 and 4 in.....34	3 in.....38
4 1/2 in.....34	3 1/2 and 4 in.....43
5 and 6 in.....33	4 1/2 in.....No quotations
7 to 13 in.....30	5 and 6 in.....37
	7 to 13 in.....34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1 1/2 in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days: [Open-hearth stock, \$5 per ton above these prices.]

Blue Annealed—Bessemer		Cents per lb.
Nos. 3 to 8	.....	8.00 to 8.50
Nos. 9 and 10	.....	8.25 to 8.50
Nos. 11 and 12	.....	8.50 to 8.75
Nos. 13 and 14	.....	8.75 to 9.00
Nos. 15 and 16	.....	9.00 to 9.25
Box Annealed, One Pass Cold Rolled—Bessemer		
Nos. 17 to 21	.....	8.30 to 8.50
Nos. 22 and 24	.....	8.25 to 8.55
Nos. 25 and 26	.....	8.40 to 8.90
No. 27	.....	8.45 to 9.00
No. 28	.....	8.50 to 8.95
No. 29	.....	8.55 to 9.05
No. 30	.....	8.65 to 9.15
Galvanized Black Sheet Gage—Bessemer		
Nos. 10 and 11	.....	8.50 to 9.00
Nos. 12 and 14	.....	8.60 to 9.10
Nos. 15 and 16	.....	8.75 to 9.25
Nos. 17 to 21	.....	8.90 to 9.40
Nos. 22 and 24	.....	9.05 to 9.55
Nos. 25 and 26	.....	9.20 to 9.70
No. 27	.....	9.35 to 9.85
No. 28	.....	9.50 to 10.00
No. 29	.....	9.75 to 10.25
No. 30	.....	10.00 to 10.50
Tin-Mill Black Plate—Bessemer		
Nos. 15 and 16	.....	7.80 to 8.30
Nos. 17 to 21	.....	7.85 to 8.35
Nos. 22 and 24	.....	7.90 to 8.40
Nos. 25 and 27	.....	7.95 to 8.45
No. 28	.....	8.00 to 8.50
No. 29	.....	8.05 to 8.55
No. 30	.....	8.05 to 8.55
Nos. 30 1/2 and 31	.....	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery							
Copper, New York		Tin.	Lead		Spelter		
Oct.	Lake	lytic	New	St.	New	St.	
10.....	23.50	23.50	60.62 1/2	7.50	7.37 1/2	8.25	8.00
11.....	23.50	23.50	60.62 1/2	7.00	7.37 1/2	8.25	8.00
13.....	23.50	23.50	60.62 1/2	7.00	6.87 1/2	8.25	8.00
15.....	23.50	23.50	61.00	7.00	6.87 1/2	8.25	8.00
16.....	23.50	23.50	61.00	7.00	6.87 1/2	8.25	8.00

NEW YORK, Oct. 17.

Inactivity characterizes practically all metals. On Friday, Oct. 12, there was no market, due to a holiday. Copper is nominal at the Government price. Tin is moderately active and steady. Lead is inactive and lower. Spelter is dead and unchanged. Antimony is lifeless with no change.

New York

Copper.—The copper problem is still unsolved. Definite information as to the exact status is hard to obtain. Various reports are circulating but they are contradictory. It is certain that committees representing producers and consumers are meeting frequently in an endeavor to solve the problem of the equitable distribution of copper after the Government and its allies' needs are provided for. It is stated that consumers are now receiving metal on old contracts, especially for October delivery, but that no copper is being sold at the new price of 23.50c., which we continue to quote as nominal. The amount available for the general market will not be known until the committees finish their work. Small lots are going to needy consumers at around 28c. The London market is unchanged.

Tin.—There have been fair sales of tin for future shipment from the East in the past week, but otherwise the market has been without interest. On Monday, Oct. 15, probably 300 tons of January and February shipment from the Straits changed hands, as well as a little nearby metal. For two lots of 50 tons each of futures, 57.62 1/2c. was paid on that day. Previous to this, except on Saturday, Oct. 13, when there was good inquiry for futures, the market was extremely dull. Yesterday, Oct. 16, it was difficult to interest buyers and there were only moderate sales of January-February shipment from the East. In the entire week there has been practically no business in spot tin which is now almost in a specialty class, due to permit difficulties. The quotation yesterday was 61c., New York. Arrivals up to Oct. 15 inclusive, have been 1540 tons, with the quantity afloat 4520 tons. The London market has advanced £2 per ton in the week to £247 10s. for spot Straits.

Lead.—The startling reduction of 1c. per pound late last Thursday by the leading producer, bringing the price to 7c. New York, has been the feature. It came as a surprise because of its extent, not more than 1/2c. per pound having been looked for. The cause had been the offering by independents of round lots for any position to the end of the year at concessions under the former price of 8c. New York, but buyers did not appear. The entire situation is bearish, and the future is hard to judge, with the added rumor of a threatened Government price fixing of lead under 6c., New York. Four months ago lead was selling at 12c., New York. It is stated that already there have been offerings below the new price, but in general the market is unsettled and quiet.

Spelter.—The market is now confronted with price fixing by the Government as an added burden. Announcement is made that this will be done as soon as the Federal Trade Commission's investigation of costs is completed. This is likely to take some time, and the prospect for a settled market in the near future is not bright, if the report is true. While the market is exceedingly dull, with demand very small, it is fairly firm at 8c., St. Louis, or 8.25c., New York, for

early delivery with 1/4c. to 1/2c. higher asked for November and December. This is partly due to the nearness of present prices to cost of production. A factor by no means bullish is the mid-year report of the U. S. Geological Survey, which shows that smelting capacity had been increased up to June 30.

Antimony.—There is very little demand, and Chinese and Japanese grades are quoted at 15c. per pound, New York, duty paid.

Aluminum.—The market is lower and inactive. No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 38c. to 40c. per pound, New York.

Old Metals.—We are quoting nominally on the basis of the Government arrangement with the producers, but purchasers other than the Government are obliged to pay from 26c. to 27c. per lb. for heavy crucible copper. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible (nominal).....	23.50
Copper, heavy and wire (nominal).....	23.50
Copper light and bottoms.....	22.50 to 23.00
Brass, heavy.....	18.00 to 18.25
Brass, light.....	14.00 to 14.25
Heavy machine composition.....	25.00 to 25.25
No. 1 yellow rod brass turnings.....	17.25
No. 1 red brass or composition turnings.....	19.00 to 21.00
Lead, heavy.....	7.50
Lead, tea.....	6.50
Zinc.....	6.50

Chicago

OCT. 15.—Some consumers who have contracted for copper are worrying over the manner in which deliveries lag, but so far melters have found enough metal with which to continue operations, and it is hoped and believed that the Government will release enough to prevent any shut-downs. Quotations cover a wide range, 30c. having been paid in some transactions. An instance is mentioned where an Eastern dealer asked 32.50c. for Lake copper. Tin is strong, and has been moving in a satisfactory way. Lead and spelter are dull, though the latter has a better tone. The old metal market continues quiet. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 61.50c.; small lots, 63.50c. to 64.50c.; lead, 6.95c.; spelter, 8.25c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21.50c.; copper clips, 21c.; copper bottoms, 20c.; red brass, 20.50c.; yellow brass, 15c.; lead pipe, 5.50c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 15.—The market has been quiet and in some respects slightly weaker. The close to-day on carload lots was: Lead, 7.25c. to 7.50c.; spelter, 8c. to 8.25c. In less than carload lots the prices were: Lead, 8c.; spelter, 9.25c.; tin, 66c.; copper, no market; Asiatic antimony, 18c. In the Joplin district zinc blende was weaker, the price for 60 per cent metal ranging from \$50 to \$70 per ton, with most of the sales between \$55 and \$65, and the average for the week for the district \$65. Some few lots brought as high as \$75 for special quality. Calamine ranged from \$35 to \$40, basis of 40 per cent metal, with the average for the week \$38. Lead ore was weaker, 80 per cent metal selling at \$87.50, with the average for the week \$87. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 18.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; tea lead, 5c.; zinc, 6c.; lead, 6c.

License Policy Announced

WASHINGTON, Oct. 16.—On Oct. 10, notice was given that Collectors of Customs would no longer license by use of the shipper's Export Declaration shipments containing an amount of any one commodity less than \$100 in value, provided such shipments contained articles on the "Conservation List."

The War Trade Board has announced further that Collectors of Customs will no longer license by use of the shipper's Export Declaration shipments of arms or munitions of war when destined to Mexico, even if the value be less than \$100.

IRON AND INDUSTRIAL STOCKS

Industrial Stocks Still Declining—Some of the Causes Given

NEW YORK, Oct. 16.

Last week was another period of decided declines and with hardly an exception railroad and industrial stocks lost ground. The causes usually given for this continued liquidation are high money rates, usually attributed to the destruction of war and to the heavy demand, decreased earnings, selling on account of fear that peace may bring lower earnings to some properties, expected reduction of dividends on account of increased taxes, selling to invest in Liberty bonds, uncertainty as to the Government prices, embargoes and other matters, labor shortage and uncertainty as to the future condition of the labor market, and short selling. The selling for investment in Liberty bonds is undoubtedly an important factor. The *Wall Street Journal* says:

"The decline in the shares of the Bethlehem Steel Corporation has been almost as sensational as the advance which started shortly after the European war. The old common stock of Bethlehem Steel sold as high as \$700 a share in the latter part of 1916. The closing price Wednesday for the new "B" stock was \$76.50 a share, the equivalent of \$206 a share for the old stock, thus representing a decline of \$494 a share, or \$54,104,000 from the high record. Bethlehem Steel has not wasted any money, and has added millions of dollars to its value in construction and surplus. In the three years to end Dec. 31, 1917, it will show a surplus for the new common stock of something like \$150 a share, or \$90,000,000. All this money has been spent either for construction, or has been added to surplus and working capital. That Bethlehem's expenditures for depreciation have been ample, is evident from the fact that last year its charges for repairs and depreciation amounted to nearly \$27,000,000, equal to \$45 a share on the 600,000 shares of common stock.

Among the steel and industrial companies which recorded losses last week were the following: Allis-Chalmers Mfg. preferred, 2½ points; American Can common, 3½; American Car & Foundry common, 4; American Locomotive common, 5½; Baldwin Locomotive common, 6¾; Bethlehem Steel, 8; Bethlehem Steel, class B, 9¾; Colorado Fuel, 3¾; Crucible Steel common, 3¾; General Electric, 3¾; Lackawanna Steel, 3½; Midvale Steel, 3¾; Republic Iron & Steel common, 2¾; United States Steel common, 4¾; United States Steel preferred, 2.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	18½-20½	Int. Har. Corp., com.	64-66
Allis-Chal., pref.	74-76	Int. Har. Corp., pref.	103
Am. Can., com.	37½-42½	Lacka. Steel	75-80
Am. Can., pref.	95½-98½	Lake Sup. Corp.	11-15½
Am. Car & Fdry., com.	62¾-67¾	Midvale Steel	42¾-47½
Am. Car & Fdry., pref.	108	Nat.-Acme	30-32
Am. Loco., com.	52-55¾	Nat. En. & Stm., com.	39-42½
Am. Loco., pref.	99-100	Nat. En. & Stm., pref.	94
Am. Rad., com.	292-305	N. Y. Air Brake	112-118
Am. Ship., com.	90-91	Nova Scotia Steel	78¼-86
Am. Steel Fdries.	57½-62	Pitts. Steel, pref.	97
Bald. Loco., com.	49¾-57	Pressed Stl., com.	53-58¾
Bald. Loco., pref.	96-97½	Pressed Stl., pref.	98¾-99¼
Beth. Steel, com.	70½-82½	Ry. Steel Spring, com.	37½-43¼
Beth. Steel, class B	69¾-83¾	Ry. Steel Spring, pref.	96¼
Beth. Steel, pref.	90-93	Republic, com.	71-78
Case (J. I.), pref.	80-80¼	Republic, pref.	98¾-99¾
Central Fdry., com.	27-29¾	Sloss, com.	37¾-40½
Chic. Pneu. Tool	57-57½	Superior Steel	33¼-40
Cola. Fuel	34¾-40	Transue-Williams	38¾-40½
Cruc. Steel, com.	62-67¾	Un. Alloy Steel	39¾-40¾
Cruc. Steel, pref.	90-93	U. S. Pipe, com.	13½-14
Gen. Electric	134½-139	U. S. Steel, com.	99¼-106
Gt. No. Ore. Cert.	26¼-30¾	U. S. Steel, pref.	111¾-115½
Gulf States Steel	88-90¾	Va. I. C. & Coke	55-56¼
Gulf S. Steel, 1st pref.	102	Warwick	9
Int. Har. of N. J., com.	104½-107½	Westing. Elec.	40-43¾
Int. Har. of N. J., pref.	110		

Lackawanna Earnings

The report of the Lackawanna Steel Co. for the nine months of the present year show earnings of \$21,104,516, equivalent to \$52.12 per share on the common stock, compared with \$24.11 per share on the common stock in the corresponding period of 1916. The increase in earnings was \$9,760,696. In the third quarter of 1917 the net earnings amounted to \$7,021,871, an increase of \$2,976,678 compared with the same period in 1916. Excess profit taxes imposed by the recent act of Congress have not been deducted. The unfilled orders at the end of the third quarter were 791,962 tons, an increase of 46,268 tons compared with the same date in 1916.

Industrial Finances

The annual meeting of stockholders of the Westinghouse Air Brake Co. of Pittsburgh will be held at Wilmerding, Pa., where its works are located, on Thursday, Oct. 18. The annual report of the company for fiscal year ended July 31 has been sent out. The net profit shown for the year, after the usual charges and after setting up adequate reserves to cover estimated tax requirements and other contingent liabilities, is \$6,388,462.66, as compared with \$9,396,103.48 in 1916 and \$1,575,838.50 for 1915. The increase of total assets from \$36,836,976.62 last year to \$44,076,559.69 this year, is due in large part to increased investment account through the acquisition of Union Switch & Signal Co. stock.

The Burt Electric Co., Erie, Pa., has called a special meeting of its stockholders to be held Dec. 8 to vote on a proposed increase in the capital stock. The company has a large amount of Government work on order for electrical equipment and plans to increase its plant facilities.

A special meeting of the stockholders of the New Britain Machine Co., New Britain, Conn., has been called for Wednesday, Oct. 24, to take action on the recommendation of the board of directors to increase the capital stock of the company from \$1,000,000 to \$1,500,000. The income from the new issue of stock will be used for the enlargement of the plant and improvements in equipment.

Dividends

The Central Foundry Co., quarterly, 1¼ per cent on the preferred, payable Nov. 15.

The Cleveland Cliffs Iron Co., quarterly, 2½ per cent, payable Oct. 25.

The Colorado Fuel & Iron Co., quarterly, ¾ per cent on the common and 2 per cent on the preferred, payable Oct. 25.

The Wheeling Mold & Foundry Co., quarterly, 4 per cent on the common, payable Nov. 1, and 2 per cent on the preferred, payable Oct. 1.

British Control of Lead Supplies

Possession of all pig lead, virgin re-melted, old scrap and residues in the United Kingdom, except such lead as may be in the hands of a manufacturer in his own works, was taken over by the Ministry of Munitions on Sept. 1. The lead so taken will be paid for on delivery at the following maximum prices: Virgin pig, £29 per ton c. i. f., £30 ex store; sheet lead, £39 10s., delivered United Kingdom, less 2½ per cent monthly account; lead pipe, £40 per ton delivered United Kingdom, less 2½ per cent monthly account. Red lead and litharge, £42 per ton, less 2½ per cent monthly account in 5 cwt. casks.

A 13-acre tract near Fort Independence Point on Narragansett Bay, owned by the City of Providence, R. I., has been commandeered by President Wilson as a site for the boiler plant of the Fore River Shipbuilding Corporation, at which are to be constructed the boilers for the destroyers to be built by the Fore River company at its new Quincy, Mass., yard.

WORKMEN BADLY NEEDED

Labor Shortage Seriously Interferes with Government Operations

WASHINGTON, Oct. 16.—Labor is just now the most harassing problem facing the Government. Chairman Hurley of the Shipping Board stated that the labor shortage is the only important obstacle in the way of the enormous merchant shipbuilding program upon which the Government has launched. The delivery of supplies, and this applies to the steel producers of the United States, contains no elements for criticism. On the other hand, there is a serious shortage of labor, and Mr. Hurley is now endeavoring to find some remedy for it.

The Council of National Defense has taken the problem up from the point of view of housing. With the consent of the President a commission has been appointed to investigate the conditions prevailing in manufacturing centers. This commission will make some definite recommendations regarding the construction of shelter for the vast army of laborers who are necessary to the successful prosecution of the enormous industrial production which must be carried out to win the war.

Chairman Hurley, in company with Admiral Capps, general manager of the Emergency Fleet Corporation, is now engaged upon a series of tours of inspection of the various shipbuilding yards in the East. Their first trip was made to Sparrows Point, where the Bethlehem company is building ships. Mr. Hurley stated that the Sparrows Point plant is running at but 50 per cent capacity because it is impossible to obtain workmen. Similar conditions prevail at the plants of the New York Shipbuilding Co. and Cramps.

Some Pay Very High Wages

It is feared that too liberal a view was held toward such new yards as have sprung up during the past year in the United States. These new yards took contracts for construction at prices unknown before. In some instances, it is said, the new yards have taken on contracts for ships at as much as \$200 a ton, whereas the older plants are still engaged upon work which will pay them but \$80 or \$90 per ton. The new yards have been enabled, by reason of the more favorable contracts, to pay higher wages. The result has been a gradual withdrawal of labor from the older established plants to the new yards.

The Shipping Board is now faced with the problem of either restricting the shipbuilding output of the country or increasing the supply of labor in the shipyards. There is a limit to the increase of labor because in the building of ships the skilled workman is an important factor. It is believed, nevertheless, that a good many unskilled workmen can be taken on and trained. Skilled workmen in other lines of industry might be induced into the yards and there trained into shipbuilding after a brief period.

Making a Survey

The Department of Labor announces that through the United States Public Service Reserve it is making a bird's-eye survey, from the information at hand in Washington, of the requirements for additional men likely to be needed in the near future by various branches of the Government and concerns holding important war contracts. The officers of the Reserve in charge of the work expect to keep the information secured up to date so that at all times an intelligent estimate can be made of what requirements are in sight.

At present there is no department or place where any comprehensive information is at hand as to what men are going to be needed in various civilian activities directly connected with the war. A man seeking to find an opportunity for service can only wander from office to office trying to pick up information as to where he can be of use. When this work is done the Reserve not only will have at hand a large list of members who have indicated their willingness to respond to a Government call, but it will also be able to divert those who

wish to undertake immediate service to the proper source of such employment.

The securing of this data is an essential preliminary to any intelligent effort to deal with the scarcity of skilled labor, which it is expected will shortly become acute here as it has in other countries engaged in the war.

British Will Make Tour

Four members of the British Ministry of Munitions leave Washington this week on an extended tour through several Middle Western and Eastern States for the purpose of placing at the disposal of American industrial leaders, both employers and employees, Great Britain's experience in promoting the production of munitions, particularly from the standpoint of the distribution and effective employment of labor. The commission goes at the invitation and under the auspices of the Council of National Defense and the several State councils.

Although the members of the party will make some public addresses, it is expected that their information will usually be disseminated through a series of small informal conferences. Their first stop will be at Pittsburgh, and among the other cities to be visited are Indianapolis, St. Louis, Chicago, Detroit, Cleveland, Buffalo, New York and Boston.

Westinghouse Electric & Mfg. Co. Advances Wages

Another increase in wages for shop employees aggregating nearly \$2,000,000 a year has just been announced by the Westinghouse Electric & Mfg. Co. Effective Oct. 16, all employees observing shop hours, except munition workers, will receive an additional bonus of 10 per cent if they are on a salary or time-rate basis, and of 7 per cent if they are on a piece, premium or task basis. The 20,000 shop employees of the Westinghouse company form one of the most highly skilled organizations in the country. It is also one of the best paid bodies as well. Increases granted since the outbreak of the European war amount to about 60 per cent of the former average compensation.

News of the Labor World

Union molders employed in Louisville, Ky., plants have formulated demands for increased wages and there are assertions made by union officials that a strike will be called unless the increases are forthcoming. A nine-hour day, a minimum wage of \$4, time and a half for overtime and double time on Sundays are asked for. The scale is now from \$3.25 to \$3.75 for a 10-hr. day, although leading employers state that wages are ranging often up to \$4.50 a day. The plants of the American Elevator & Machinery Co., Vogt Bros. Mfg. Co., the Henry Vogt Machine Co., the W. E. Caldwell Co. and Balke & Co. would be affected immediately, while other concerns would likely be involved in case of a strike. About 200 molders are concerned.

Twenty-five employees of the Nordyke & Marmon Co., Indianapolis, have been exempted by the army appeal board, by request of the company. They are expert workmen on aeroplane motors. The company has lost 400 men by draft and volunteer enlistment.

The A. Buch's Sons Foundry Co., Elizabethtown, Pa., has announced a wage increase of 10 per cent, effective immediately.

A few employees at the light plate and boiler shops of the Pennsylvania Shipbuilding Co., Gloucester City, N. J., declared a strike on Oct. 6, with demand for 10 per cent increase in wages.

The Eastern Malleable Steel Co. and the Pullman Co., Wilmington, Del., are now employing women for light work in their local machine repair shops and foundry. The women wear overalls and jumpers.

Increases in wages, which ultimately will amount to \$8,000,000 a year, were announced Oct. 16 by the Curtiss Aeroplane & Motor Corporation, Buffalo. A 5 per cent advance, applicable to all employees, becomes effective at once. A premium system has been adopted which will make it possible for skilled workmen to add as high as 30 per cent to their wages. In addition to

these advances by the company President William A. Morgan will distribute as premiums \$150,000 in Liberty Bonds. The company is about to occupy a new plant, covering 30 acres, which has been built in 68 days.

Over 100 iron molders and helpers are on strike at the Vulcan Iron Works, New Britain, Conn. The molders demand \$4 for nine hours work and time and one-half for overtime; also a bonus of 30 cents on each dollar earned in wages. The laborers ask for 35 cents an hour with the overtime and bonus provisos asked by the molders.

Machinists and general floor helpers of the Standard Machine Co., Auburn, R. I., went on strike Oct. 9, after demands for an advance of 15 per cent in wages and time and one-half for overtime had been refused. The men are not organized.

The scarcity of skilled and unskilled labor is seriously crippling industries in the Shenango Valley, Pennsylvania. Unskilled labor is at a premium, and in some cases is being paid as high as \$4 per day. Thousands of men have left shops, factories and steel mills to join the National Army, and owing to the scarcity of men their places are being filled by women and girls as far as possible. The American Sheet & Tin Plate Co. has tin plate mills at New Castle, Sharon and Farrell, and owing to its inability to get men, is employing women and girls in tin plate labor where it is practicable to do so. Some women are employed at the roughing mills on work heretofore done by men and are earning from \$3 to \$4.50 per day. Labor conditions in the Shenango Valley are likely to get worse as the army draft goes on, and output of products by the manufacturing plants in that district will then show a further considerable falling off. The work done by the women and girls employed in the factories to replace men is said to be highly satisfactory, and it is probable that after the war is over a good deal of labor formerly performed by men will continue to be done by women and girls.

Co-operation of Waste Material Dealers Needed

The Metals Division of the National Association of Waste Materials Dealers, in convention at the Hotel Astor, New York, listened to an address on Tuesday by Eugene Meyer, Jr., assistant to Bernard M. Baruch, head of the Raw Materials Division of the War Industries Board. Mr. Meyer said he had been delegated to take charge of the work of conserving supplies of copper, zinc, lead, antimony and other non-ferrous metals for the Government.

"Your capacity for usefulness to the Government at this time is considerable," Mr. Meyer said. "Just now, the situation as to copper is most urgent and pressing. Not only do we want to establish an interest between our board and your industry, but it is desired that you name a committee to co-operate with the board, which shall speak for the important industry you represent. We don't know when a situation may develop when your knowledge of metals may be helpful to the Government."

"You as an industry should organize to carry out the spirit of the copper agreement, and any other agreements that may be proposed by the War Industries Board. The suggestion I make is that you pledge support and stand by these orders and agreements, and act in accordance with all regulations promulgated. It is the intention of the Government, through the board, to accord fair and dispassionate treatment to all interests, and all that we ask is that you do the fair and helpful thing in order to assist the Government and its allies to win the war."

British Plant to Be Extended

A cable dispatch from London says that the Effio Vale Steel, Iron & Coal Co. will spend between \$15,000,000 and \$20,000,000 within the next two years extending the plant, including enlargement of the blast-furnace capacity and coke-oven departments, besides additions to the steel works. A subsidiary plant in connection with the blast furnaces, constructed at a cost of about \$1,250,000, will enable the company to recover potash in considerable quantities.

Pittsburgh and Nearby Districts

The Blaw-Knox Co., Pittsburgh, with plants at Hoboken and Wheatland, Pa., builder of steel forms for concrete construction, also structural steel work and transmission towers, has lately bought more ground adjoining its plant at Hoboken and will install a modern water gas welding plant. The company states that its two plants are operating to utmost capacity, its contracts being entirely Government work on direct and indirect orders.

The Heppenstall Forge & Knife Co., Forty-seventh and Hatfield Streets, Pittsburgh, Pa., manufacturer of iron and steel forgings, has commenced the construction of a new one-story machine shop, 140 x 350 ft., and furnace, on Forty-sixth Street, to cost about \$100,000.

The Pittsburgh Screw & Bolt Co., Preble Avenue, Pittsburgh, Pa., is building a two-story addition about 35 x 44 ft.

Installations of Booth-Hall Electric Furnaces

New installations of Booth-Hall electric furnaces are announced as follows:

The West Michigan Steel Foundry Co., Muskegon, Mich., will install a 3-ton furnace for making steel castings from cold scrap. It will be operated by power furnished by the Consumers Power Co.

The Duriron Castings Co., Dayton, Ohio, will install a ¾-ton furnace for producing castings of Duriron. Power will be furnished by the Dayton Power & Light Co.

Another furnace of this type of 1½-ton capacity will be put in operation late in November by a company whose name cannot be divulged until the furnace is started.

These three furnaces are in addition to a 3-ton furnace already announced which will be put in operation early in November by the Midland Electric Steel Co., Terre Haute, Ind., bringing the total of this type to four in the United States.

The Booth-Hall Co., 565 West Washington Boulevard, Chicago, have recently issued a 4-page leaflet giving drawings of their furnace and complete information regarding its operation, whether for single, two or three-phase current. Furnaces of 8 and 10-ton capacity are built three phase; those of 1½-ton capacity for the straight melting down of scrap are built single phase, except where the power conditions are such that a single-phase load is not acceptable, in which case the two-phase furnace is recommended. Furnaces of 2½ to 6-ton capacity are built two phase. The claim is made that all parts of the Booth-Hall furnaces are constructed as simply and strongly as possible and that any repairs can be effected with unusual ease.

Agree Not to Sell to Enemy

WASHINGTON, Oct. 16.—The War Trade Board, created by the Executive order signed by the President on Oct. 12, 1917, has drawn up an agreement, to be signed by exporters when shipping to their own branches in foreign countries. The exporters agree that none of the articles contained in any of the shipments for the licensing of which applications are pending, will be directly or indirectly re-exported, or sold, transferred or delivered, either in their present or any other form, contrary to the agreement herein contained. The signers agree not to sell or deliver, directly or indirectly, or trade, or engage in the doing of any business with enemies or enemy allies, as herein defined, or for or on account of, or on behalf of, any such enemy or enemy allies during the continuance of the present war.

The regular monthly meeting of the Pittsburgh section of the Association of Iron and Steel Electrical Engineers will be held in the Hotel Chatham, Pittsburgh, on Saturday, Oct. 20. Ward Harrison will present a paper entitled "Some Recent Advances in Industrial Lighting Equipment." Mr. Harrison's paper will discuss particularly those aspects of effectiveness which are dependent upon the skillful utilization of light to produce the best illumination. As the demand for production increases, so do requirements for good lighting become greater. Practically every electrical superintendent has installed new lighting systems in the last year or two.

Effect of Pickling on the Strength of Steel*

Chemical or Electrolytic Treatment as Cathode Weakens the Metal—Treated as the Anode Physical Properties Are Unimpaired

BY JOHN COULSON

BRITTLENESS of steel springs resulting from acid pickling and electroplating is a well-known phenomenon. Tempered springs which are pickled even for a few seconds in an acid bath snap when subjected to strain. Such springs, however, can be electrolytically pickled without destroying their resiliency. This paper cites an electrolytic process for removing oxides from the surface of iron, steel and other metals without impairing their physical properties.

It is known that metals absorb gases and that the amount absorbed depends upon the nature of the gas, the condition and character of the metal and the surrounding medium. These absorbed gases appear to play an important role in the behavior of iron, steel and certain alloys. Electrolytic iron is extremely brittle due principally to occluded hydrogen, and there appears no doubt that the brittleness of steel springs after pickling is due to the absorption of hydrogen during the ordinary pickling process. This effect is still more pronounced if the springs are made the cathode in an acidulated electrolyte.

Numerous experiments were carried out to determine the behavior of steel springs, drill rod, tempered steel, Bessemer and cold-rolled steel rods after undergoing different pickling treatments. The pickling bath consisted of a 27 per cent solution of H_2SO_4 kept at 60 deg. C. Test specimens of each of the above materials were treated consecutively; one-third of each set was pickled by the ordinary chemical process, one-third electrolytically as anode, and one-third as cathode. The lead tank containing the pickling bath served for the second electrode in the electrolytic processes.

Tests in Steel Springs

The springs dealt with were 3/32 in. (2.4 mm.) diameter tempered steel wire wound closely in the form of a helix 3/4 in. (19 mm.) diameter. Twenty of these springs constituted a set for the testing machine. The machine was adjusted to exert a maximum tension of about 16 lb. (7.3 kg.) on each spring, and then dropped to zero again. The number of oscillations of the machine and the life of each spring were automatically recorded.

Table 1—Life Test on Steel Springs Variouslly Treated

No.	Treatment	Load, Lb.	Life, (No. of Oscillations)
1	Original state	16.0	11,090,000
2		15.8	191,426
3		15.8	Not broken
4		15.8	13,173,000
5	Sand-blasted	16.1	10,017,000
6		15.6	13,715,000
7		15.8	8,373,210
8		16.0	11,495,000
9	Pickled 40 sec. chemically	16.0	Broke during preliminary test
10		15.4	
11		16.0	
12		15.6	
13	Pickled 40 sec. as cathode	15.8	45,000
14		15.8	Broke during preliminary test
15		15.9	
16		15.3	
17	Pickled 40 sec. as anode	16.0	14,220,000
18		16.0	1,714,000
19		15.8	12,387,000
20		15.8	11,725,000

Table 1 gives the history of one of the many sets of springs tested. Each set of springs was divided into groups of four, each group was constituted of springs of like treatment. The first group tabulated received

*From a paper presented at the thirty-second general meeting of the American Electrochemical Society at Pittsburgh, Oct. 5, 1917. The author is physical chemist, Westinghouse Research Laboratory, East Pittsburgh, Pa.

no treatment further than tempering, which was common to all. The second group was sand-blasted; the third group was pickled 40 sec. chemically; the fourth group was pickled 40 sec. electrolytically as cathode, and the fifth group was pickled 40 sec. as anode. All the springs pickled chemically and as cathode electrolytically broke during the preliminary test, which consisted of a continuous strain for 12 hr. The crystalline structure of the breaks resembled that of glass-hard steel. No difference appeared to exist in the properties of the other groups of springs. All withstood, on the average, about ten million oscillations before breaking.

Bending tests were carried out on bars 1 by 1/4 in. (2.5 x 0.6 cm.) cold rolled steel. Test pieces which had been pickled chemically and electrolytically as cathode showed fatigue and cracks much sooner than untreated test pieces or pieces which had been pickled electrolytically as anode. The records for the last two cases were very similar. The Brinell test for hardness indicated an increase of about 5 per cent for specimens pickled as cathode, while no material change was noticeable for any of the others.

Table 2—Tests on Pickled Wire and Rods

Material	Diameter		Pickling	Unit Stress		Reduction of Area, per cent
	mm.	In.		Kg. per sq. mm.	Lb. per sq. in.	
Spring steel wire	2.0	0.0785	None	178	254,000	51
	2.0	0.0785	Chemical	173	247,000	51
	2.0	0.0785	Cathode	173	247,000	51
	2.0	0.0785	Anode	176	252,000	51
	5.2	0.205	None	160	228,000	47
	5.2	0.205	Cathode	157	224,000	47
Drill rod ..	5.2	0.205	Anode	155	221,000	49
	6.3	0.25	None	118	169,000	22
	6.3	0.25	Cathode	113	162,000	22
Hot rolled Bessemer.	6.3	0.25	Anode	114	163,000	25
	5.9	0.236	None	48	69,000	22
	5.9	0.236	Cathode	47	68,000	22
Cold rolled steel	6.3	0.25	Anode	47	68,000	22
	6.3	0.25	None	74	106,000	50
	6.3	0.25	Chemical	70	100,000	40
	6.3	0.25	Cathode	72	103,000	35
	6.3	0.25	Anode	71	102,000	50

Tests on the tensile strength, elongation and reduction were determined for a number of rods of different materials, some of which had been pickled chemically, others electrolytically. Table 2 gives the results of a few of these tests. Each number tabulated is the average value for three rods similarly treated, and as a rule the values for a given set of rods all agreed fairly well.

The table shows that all the materials pickled either chemically or electrolytically as cathode show deleterious effects. The properties of the high carbon steel undergo the greatest modification. The majority of specimens of this material tested showed no elongation or reduction whatever when pickled electrolytically as cathode. Anode pickling, it appears, does not impair the physical properties of any of the materials here dealt with.

The fracture of rods pickled chemically and as anode were perfectly cup shaped. The rod pickled as cathode, on the other hand, showed a very short break without any appreciable reduction in area. The same bar also showed an irregular break with a dark center encircled by a bright band. This band was well defined, and indicated clearly the depth the hydrogen penetrated the metal during the process of pickling.

The rate at which the hydrogen penetrates the metal increases with the current density. In the case of or-

dinary chemical pickling, absorption takes place more slowly. It is very probable that the hydrogen absorbed by the metal, where it loses its identity as nascent hydrogen, forms an alloy, thus modifying the physical properties of the steel. The bright band of the last test referred to indicates that the rupture took place along the crystal faces and not through the crystals. The light was reflected from the crystal faces and is, therefore, more intense than the reflection from the ruptured crystals of the central area.

Restoration by Annealing

Test specimens, made brittle by pickling either chemically or electrolytically as cathode, were restored to the original condition by annealing. This restoration was effected considerably by repickling the test pieces electrolytically as anode. A number of test pieces of spring steel 0.205 in. (5.2 mm.) diameter were pickled two minutes electrolytically as cathode; half of these broke with no elongation and no reduction. The other half was repickled two minutes electrolytically as anode, and then tested. These had an average value for elongation and reduction of 5.5 per cent and 25 per cent respectively. Non-pickled material showed 8 per cent elongation and 40 per cent reduction. It is probable that prolonged re-pickling electrolytically as anode would restore completely the physical properties of the metal.

A Summation

Hydrogen is absorbed rapidly by iron and steel when pickled either chemically or electrolytically as cathode, in acid solutions, thus causing brittleness, diminution of the tensile strength, elongation and reduction of area.

Iron and steel may be cleaned effectively and quickly by pickling electrolytically as anode, without impairing their strength, resiliency or other physical properties.

Federal Export Buys a Railroad

The New Mexico Central Railroad has been purchased by the Federal Export Corporation, 115 Broadway, New York. This property lies in a section of New Mexico that has recently been opened to oil developments. The line has a length of 120 miles extending south and southeast from the city of Santa Fe, where it joins the main line of the Atchison, Topeka & Santa Fe Railroad to Willard, where it crosses the southern branch of the Santa Fe road and thence to Torrance, where it connects with the El Paso & Southwestern. The Federal Export Corporation has in project the electrification of the road or its re-equipment with internal combustion locomotives. Its engineers are at present examining the property with the object of ascertaining the most available means of placing the road on a more productive basis.

Takes Merchant Ships

WASHINGTON, Oct. 16.—Beginning Monday, Oct. 15, the United States Shipping Board, through a chartering committee sitting in New York, took over all American merchant vessels of 2500 tons deadweight. The vessels will be chartered at a rate fixed by the board, but they will be turned back to their owners to operate under such direction as the Shipping Board chooses to impose. Thus the United States formally takes almost absolute jurisdiction of all the merchant fleet flying the American flag.

The Standard Statistics Co., New York, began recently the publication of the Standard Daily Trade Service. The design of this service is to place upon the desk of the busy executive, in compact form, a complete digest, analysis and index of all available basic business and financial information. This matter is arranged alphabetically in the eight-page daily bulletins so that a few minutes each morning will enable the executive to find what he needs to know in the mass of information, particularly in regard to foreign trade, now reaching his desk. The sources of information are given so that with the least possible loss of time the subscriber to this service is able to find the particular things he wishes to see in his trade publications.

American Manufacturers' Export Association

The American Manufacturers' Export Association held its eighth annual convention at the Biltmore Hotel, New York, Oct. 10. It commended the public stand of President Wilson against economic leagues among nations after the war; asked for a more liberal policy of the National Government toward export trade development, declared that exporters wanted no special advantage from victory of the United States in the war, and it favored an international conference to promote uniform laws and regulations governing international carriers. For example, it passed a resolution to the effect that

"The export manufacturers of the United States seek in international trade only such gains as this country is economically entitled to, and have neither desire nor design to profit by conditions created by the European conflict. The export manufacturers of the United States do not favor the principle of retaliation at the close of the war on account of the obstacles which may be found in the way of the expansion of our trade during the war."

James A. Farrell, president United States Steel Corporation, and W. W. Nichols, assistant to chairman, Allis-Chalmers Mfg. Co., New York, were elected directors for three years, and E. C. Lufkin, president Texas Co., a director for two years. George E. Smith, president Royal Typewriter Co., was elected president, and E. V. Douglass was re-elected secretary.

Further Drop in Fabricated Work

The records of the Bridge Builders and Structural Society, as collected by its secretary, George E. Gifford, 50 Church Street, New York, show that 29 per cent of the entire capacity of the bridge and structural shops of the country was put under contract in September. This corresponds to about 52,000 tons and is the average at which work was taken in the seven months immediately following the outbreak of the war in August, 1914. At no other period since 1911 has the volume of business been so low.

So far this year about 832,000 tons of bridge and building work have been closed against 1,070,000 for the same period of 1916. For business to reach a total for this year equal to the totals of either 1913 or 1914, contracting over the remaining three months would have to exceed 45 per cent. The total amount of business done in each of the years 1915 and 1916 was about 1,500,000 tons.

Record Manganese Ore Imports in August

Manganese ore imports in August were the largest for any month this year and exceed any month in 1916. They were 87,650 gross tons, the next largest months having been 81,269 tons in May this year and 81,942 tons in July, 1916. The August imports bring the total for the year to Sept. 1, 1917, to 457,878 tons, corresponding with 391,589 to Sept. 1, 1916. The average imports so far this year have been 57,234 tons per month contrasting with 48,027 tons per month in all of 1916, then a record.

The annual report of the Industrial Commission of Wisconsin for the fiscal year ended June 30, shows that the total sum of benefits paid by employers of Wisconsin under the requirements of the workmen's compensation act was \$1,576,329, compared with \$1,216,189 for the previous year. The number of cases settled last year was 17,157, against 12,848 in the preceding period. The total compensation paid to injured workmen last year was \$1,184,271, an average of \$69 per case; for medical aid to injured workmen, \$391,958, or \$23 per case.

Regular monthly meetings of the Pittsburgh section of the Association of Iron & Steel Electrical Engineers will be resumed with a meeting at the Hotel Chatham, 423 Penn Avenue, Pittsburgh, Pa., Saturday, Oct. 20. Some recent advances in industrial lighting equipment will be discussed by Ward Harrison, illuminating engineer, National Lamp Works, Cleveland.

Creditable Service from Electric Mills

Two Motor-Driven Reversing Blooming Mills Which from an Operating Viewpoint Have Justified Their Installation—Minor Alterations Which Improved Service

DATA pertaining to electrically driven reversing blooming mills which are of interest from an operating viewpoint were given by Ralph D. Nye, electrical engineer, United Alloy Steel Corporation, Canton, Ohio, in a paper presented before the Association of Iron and Steel Electrical Engineers at its convention this week in Philadelphia. These data apply to two typical installations of electrical blooming mills and, he explains, show what results have been secured. Following is a review of his paper.

Installation Number One

The installations are designated as No. 1 mill and No. 2 mill. No. 1 mill is a 34-in. blooming mill, that is, the pinions are 34 in. in diameter. The installation was designed to roll a maximum capacity of 50 tons of ingots per hour, size 18 x 20 in., and weighing about 5500 lb., to finished billets averaging 4 x 4 in., and using 21 to 23 passes. The estimated power consumption with the mill rolling at an average rate of 40 tons of ingots per hour to 4 x 4-in. billets was 26 kw.-hr. per ton of ingot rolled. The maximum torque capacity of the reversing motor is 670,000 lb.-ft. Its full-field speed is 47 r.p.m., and its maximum speed with weakened field about 100 r.p.m. The rated capacity of the induction motor is 1500 hp., and it operates on three phase, 2200 volts and 60 cycle alternating current. Its full-load speed is 350 r.p.m. The generator capacity is 1960 kw., continuous rating.

Characteristics of Service

This equipment was installed in the spring of 1915 and rolled its first steel during June of that year. The first ingots put into the mill were rolled down to a finished size four by four. The mill has practically been in continuous operation since that time, and the total delay due to trouble with the electrical drive since the mill was started does not exceed 10 hr. Some alterations were found advisable in the arrangement of control switches and on the reversing motor since installation. The number of accelerating switches was reduced and some changes were made in relays to increase rate of acceleration and speed up operation. On the motor it was found that the commutating pole coils were apt to work loose due to the heavy pulls on them at times of motor reversal, and additional fastenings were added to these coils. Also the interpoles were readjusted to prevent any movement under these stresses. The motor commutator was not under cut at first and it was found advisable to do this to improve commutation. After under cutting, a type of brush designed for under-cut commutators was installed; so that the high current peaks are handled successfully without blackening the commutator.

The motor requires forced ventilation, and it is necessary to arrange for a good supply of clean, cool air. This air is taken from outside the building through a duct about 40 ft. above the mill floor, and is not washed. No trouble from dirt collecting in the motor has been experienced. Of course, it is necessary to blow out the machine with compressed air and clean it about once a month. Twenty thousand cubic feet of air per minute, at 1½ oz. pressure per sq. in. is required to cool the motor, two fans of this capacity being provided, both of which are operated in hot weather.

All bearings on the equipment are provided with oiling lubrication. The two main bearings carrying the flywheel are operated water cooled. These bearings and also the reversing motor bearings are arranged for forced oil feed but the equipment is being run without this. The forced feed is considered an extra safeguard against bearing trouble. Neither water cooling nor

forced feed has been found necessary on the main motor bearings. It was at first thought that on account of the relatively low speed and frequent reversal of this motor the rings would not deliver enough oil, but experience shows that they do the work satisfactorily. Each motor bearing is equipped with four rings.

As an indication of the severe service that is put on this type of equipment, it may be said that at two different times the motor has twisted off a cast steel connecting spindle used to couple the motor to the pinion housings. This spindle is about 19 in. in diameter. The main motor bearing next to the pinion housing is provided with a thrust collar designed to take up any thrust due to diagonal breaking of this spindle, and in neither of the cases was any damage done to the motor.

Economic Results Obtained

As to the rolling capacity of the mill, and the cost of operating the electric equipment, the following table shows the total tonnage of ingots rolled and the actual kilowatt-hour consumption per ton for several typical months of rolling. This includes all necessary power, such as exciter and motor driven fan requirements, in addition to the main power supply.

Operating Data No. 1 Mill

Month	Monthly Tonnage	Kw.-hr. per Ton
1.....	21,100	17.7
2.....	19,400	18.4
3.....	21,200	18.6
4.....	18,800	20.6
5.....	22,100	18.5
6.....	20,000	24.6
7.....	21,800	19.5
Average	20,600	19.7

The above tonnage is made up almost entirely of ingots 20 in. by 22 in. about 70 in. long. Fifty per cent. of these were rolled down to 4x4 in. billets using 19 to 21 passes. The balance were rolled to a size averaging 6x8 in., using 17 to 19 passes. Approximately 90 per cent. of this steel may be classed as high carbon. During the sixth month where a consumption of 24.6 kilowatt-hour per ton is shown a number of new operators were breaking in on the mill, and this is thought to account for the increase of about 25 per cent. above the average in power consumption. No exact costs of attendance of repairs is available but this item is relatively small and would not exceed 15 per cent. of the power cost. The equipment is installed in a main substation where an attendant is required on the switchboard and as he also looks after the mill drive only a part of this attendance cost can be charged to the cost of rolling. The only repairs so far have consisted of brushes and switch contact renewals, the cost of which is relatively small.

Installation Number Two

No. 2 mill is a reversing bloomer having 35-in. diameter pinions. This mill is of heavier construction all the way through than the one above, being about as heavy as the average 40-in. bloomer. The rolls are 32-in. diameter and 90 in. long. This mill was expected to roll a maximum capacity of 75 to 90 tons of ingots, size of ingot 20 by 21 inches, weighing 7000 lb. each per hr., to finished billets averaging 4 x 4 in. and using 19 to 21 passes. The power consumption with the mill rolling at an average rate of 75 tons per hr. to four by four billets was estimated at 28 kilowatt-hour per ton. The reversing motor has two armatures, mounted on common shaft, each with a maximum torque capacity of 600,000 lb.-ft. This gives the motor a total maximum rating of 1,200,000 lb.-ft. The full field speed is 40 r.p.m. and the maximum speed with weakened field 120 to 130 r.p.m. Field windings consist of variable and

constant potential excited circuits. The capacity of the induction motor is 2500 hp. and it uses three phase 2200 volts, 60 cycle current. Its full load speed is 350 r.p.m. Two generators each rated at 1450 kw. continuous capacity are used.

Characteristics of Service.

This equipment was erected during the fall of 1916 and started to roll steel in December. No trouble with the drive was experienced in starting-rolling, the usual adjustments of relays and resistance necessary to make the equipment perform in the best manner being all that were necessary. The control equipment is operating as originally installed. The only mechanical adjustments necessary were to scrape in two of the bearings on the flywheel set. Since starting, only one delay, and that about half an hour has occurred. This happened during the time the floor was being put down in the sub-station, dust causing the brushes to stick in holders in one of the generators. It was found advisable to undercut the motor commutators and this has been done, giving considerable improvement in commutation. This motor requires about 35,000 cu. ft. of cooling air per min. Two fans of this capacity are installed, one is held in reserve as a spare except in very hot weather, when both are operated together. The air supply is taken from outside the sub-station building and is not washed. No trouble from dust collecting in the motor has been experienced except that it is necessary to blow it out about once a month. Rolling conditions are such that additional cooling to be secured from washed air is not necessary.

All the bearings of this equipment are arranged with oil-ring lubrication. Cooling water is used on the two flywheel bearings. It was found advisable to put forced oil feed on all the five bearings of the motor generator set in addition to the oil-ring lubrication. The motor bearings did not require it for regular operation but it was provided as an emergency measure.

Economic Results Obtained.

The following table shows the monthly tonnage rolled since this mill was started, and the total kilowatt-hour consumption per ton of ingot.

Operating Data No. 2 Mill.

Month	Monthly Tonnage	Kw.-hr. per Ton
1.....	15,000	33.5
2.....	14,800	32
3.....	19,000	30.5
4.....	21,000	28.5
5.....	25,000	27
6.....	22,000	26.7
Average	19,500	29.7

The above tonnage consists of ingots 19 and 21 in., weighing 6000 lb. each. Seventy per cent of these were rolled to 4 x 4 in. billets using 23 to 25 passes. The balance were rolled to a size averaging about 6 by 6 in. and using 19 to 21 passes. Sixty per cent of this steel may be passed as high carbon. The gradual reduction in power consumption per ton from month to month is no doubt due more to expert handling of the mill and also the increased rate of rolling. The electrical equipment is installed in a sub-station having the switchboards, rotaries and transformers and the attendance consists of one operator on each turn with a helper or clean-up man on day turn. The attendance costs chargeable to the blooming mill are not more than 1 per cent per ton of ingot it rolled. No repairs except a few brushes and switch contacts have as yet been required.

Comparison of Installations

Without going into the electrical conditions existing in these equipments it is safe to say that the operating results secured have justified their installation. Considered from the standpoint of reliability they seem to have delivered the goods. Considered from the standpoint of cost, since the cost of power is between six and seven mills per kilowatt-hour, it appears that both mills are rolling steel at a total operating cost of less than 20c. per ton. This is probably a lower cost than the average steam-driven mill. In the plant with the No. 2 equipment an engine-driven reversing mill is being

operated, rolling a steel schedule which should not require as much power per ton as the one on the electrically operated blooming mill, yet the operating cost per ton on the steam mill is at least double that of the electric.

The averages of the above tables show the No. 2 equipment is using 29.7 kilowatt-hour per ton and the No. 1 equipment 19.7 kilowatt-hour which is 10.0 kilowatt-hour more for the No. 2 mill. The six-month run on the No. 2 drive includes several months breaking in and some low tonnages so that a fairer basis of comparison would probably be to take the average of the last three months. This average shows a total tonnage of 22,500 and power consumption of 27.4 kilowatt-hour per ton of ingots. This amounts to about 10 per cent higher tonnage and 7.7 kilowatt-hour per ton, or almost 40 per cent more power than the No. 1 mill drive required.

This higher power consumption by the No. 2 equipment may be accounted for in several ways. The No. 2 mill is larger and of course heavier, having been designed to take care of large ingots and heavy drafts. The drive was laid out to roll 50 per cent more steel than the No. 1 drive. The No. 1 mill is rolling about up to its rated average capacity of 40 tons per hr., and the No. 2 mill is rolling under rated capacity. Also the No. 2 equipment is rolling a higher percentage of four by four, that is 70 per cent against 50 per cent on the No. 1. The No. 2 mill is making lighter drafts and more passes per ingot. Also it may be noted that the estimated power consumption, made before the mills started to roll was 26 kilowatt-hour and 28 kilowatt-hour per ton of ingot rolled, to four by four, on the No. 1 and No. 2 mills respectively.

It is apparent that the No. 1 mill is meeting expectations in the matter of power consumption. The No. 2 equipment at present rate of rolling is probably not down to estimated consumption of 28 kilowatt-hour per ton of four by four. No doubt it would meet this estimate if the steel were drafted heavier and 75 tons per hr. rolled. The No. 2 equipment is adapted to heavier drafts and fewer passes, and the comparison shows the advantage in having the electric drive fitted to the work to be done in the mill.

First Liberty Motor Delivered in Record Time

WAUKESHA, WIS., Oct. 15.—The Waukesha Motor Co., Waukesha, Wis., earned the distinction of being the first contractor for manufacturing the new Liberty motor for the Government, to submit its finished product to the Government. In exactly 11 days and seven hours after receiving the detailed specifications the Waukesha company completed the first motor and packed it for express shipment to Washington for official tests. This is believed to be a world's record and has resulted in a flood of congratulatory telegrams from officials and manufacturers in all parts of the country. The work was in charge of J. B. Fisher, chief engineer, and was executed under the direction of A. W. Dietzel, factory superintendent, the materials being provided under the direction of James Remington, purchasing agent. Harry L. Horning, vice-president and general manager of the Waukesha company, is chairman of the engineering committee in charge of the design of the new motor.

In an address urging the economic use of fuels, Van H. Manning, director of the Bureau of Mines, before a meeting of State officials called to assist in fuel administration, described the problem in part as follows: About 15,000,000 people shovel the 20 per cent of coal used for domestic purposes. About 250,000 firemen shovel the 60 per cent used by power plants and railroads. The householder should be made to realize that when he throws a shovelful of anthracite coal into his furnace its value is equivalent to ½ lb. of sugar or 1 pint of milk. He needs to give attention to the matter of weather strips, double windows, pipe coverings and the like. The industrial fireman, to bring about the larger economy, must be regarded as a skilled worker and be properly instructed and given proper labor-saving devices.

PERSONAL

C. W. Johnson, who was elected vice-president of the American Institute of Metals at its recent meeting at Boston, is general superintendent of the East Pittsburgh works of the Westinghouse Electric & Mfg. Co. On graduation from Ohio State University, he began his career as draftsman with the Steel Motor Co., Johnstown, Pa.



He joined the Bullock Electric Co., Cincinnati, in 1897, successively holding the position of chief draftsman, engineer and production manager. From 1904 to 1907 he was superintendent of the combined Allis-Chalmers and Bullock plants at Montreal, Canada. In the latter year he entered the employ of the Westinghouse Electric & Mfg. Co. as chief inspector. In 1909 he was promoted to the position of assistant manager of works, and in 1912 he was made general superintendent of works.

W. B. Sullivan, who was formerly Eastern representative of the Rich Tool Co., with offices at Philadelphia, has been appointed manager of sales, with headquarters at the general offices in the Railway Exchange, Chicago.

James H. Hood, Belmont, Mass., has arrived in France to assume the position of director general of construction for the Stone & Webster Corporation, Boston. He will be in charge of the building of a great ordnance depot for the United States Government. It is understood that the contract calls for the erection of 28 storehouses and 10 shop buildings, each 250 ft. wide and 500 ft. long, and for the building of a 10,000-hp. power station.

H. E. Dodge, Dodge Brothers, Detroit, has turned over to the Government for war service a second steam yacht.

Dr. Ira N. Hollis, president of the American Society of Mechanical Engineers, and also of the Worcester Polytechnic Institute, will be the guest of the joint engineering societies of San Francisco at a dinner on Oct. 25.

R. E. Prussing is now in charge of the Detroit agency of the Whiting Foundry Equipment Co., Harvey, Ill. He has been in the employ of the company for 10 years, in the engineering, estimating and sales departments.

J. S. Shorey, General Electric Co., delivered an address before the Engineers' Club of Trenton, N. J., Oct. 11, on centrifugal blowing engines. H. L. Gantt, consulting management engineer, New York, is to address the club on Oct. 22 on the economic position of the engineer.

S. Rea Morria, formerly connected with the National Tube Co., Pittsburgh, has been elected secretary-treasurer of the Pottstown Steel Products Co., Pottstown, Pa., now building a new plant.

Charles M. Dill, Philadelphia, local representative of the Witherow Steel Co., has resigned to join the United States Army.

In the United States service, army or navy, are 50 employees of Joseph T. Ryerson & Son, Chicago, the number including the volunteers and those drafted. Two vice-presidents of the corporation are doing their full share, Donald M. Ryerson being an ensign at Annapolis, and Edward L. Ryerson, Jr., being a first lieutenant in the Signal Corps and now connected with the Aircraft Production Board, Washington.

J. E. Maloney, formerly sales manager of the pressed-steel department of the Hydraulic Pressed Steel Co., Cleveland, has been made general sales manager of that company, filling a vacancy caused by the recent death of O. P. Stehn. C. W. Vilas, formerly assistant

factory manager, has been made sales manager of the pressed-steel department.

Thompson Lothrop, an inspection engineer of the United Alloy Steel Corporation, Canton, Ohio, has entered the Government service as first lieutenant, and has been assigned to the truck division of the War Department.

H. F. Brandes, for the past four years works manager of the Putnam Machine Co., Fitchburg, Mass., who directed the erection and equipment of the new plant of the company, has resigned, and returned to Bridgeport, Conn., for the present, to give attention to his interests in the Springfield Mfg. Co. His son, who formerly managed this plant, has been drafted.

Charles O. Rowe has been appointed representative in the Philadelphia district of the Hess Steel Corporation, Baltimore. For the past six years he was in the sales department of the Union Drawn Steel Co.

E. J. Renshaw has been appointed general manager of the Nicetown Plate Washer Co., Juniata and Clarissa Streets, Philadelphia.

Don R. Marsh, production manager with the Buffalo Forge Co., has given up his work to assume similar duties at Washington in the production of ammunition. He will receive a captain's commission.

H. F. Bardwell has been appointed New York district manager for the Vanadium-Alloys Steel Co., with offices at 30 Church Street, New York.

C. F. Goodrich, assistant manager of the Buffalo Forge Co.'s Boston office, has left for active duty as first lieutenant in the Ordnance Department, and is stationed at the Watervliet Arsenal.

A. W. Hubbard, assistant to the president of the Andrews Steel Co. and Newport Rolling Mills for the past 26 years, has been elected president and general manager of the Charleston Alloy Steel Co., Belle, W. Va. P. D. Mackey has been appointed general superintendent to succeed Charles A. Swan, resigned.

E. R. Stettinius, a member of the firm of J. P. Morgan & Co., who had charge of all buying for the Allies, has been assigned a new task by the War Department. He will place and supervise all contracts for trench tools and other materials needed by the department.

L. N. Hall, for 17 years city salesman in Philadelphia for the Carnegie Steel Co., will become connected with the Pennsylvania Steel Export Co., Widener Building, Philadelphia, on Nov. 1.

Frank H. Brooks has resigned from the presidency of E. & T. Fairbanks & Co., scale manufacturers, St. Johnsbury, Vt., effective soon, and will be succeeded by P. C. Brooks, vice-president and manager of the Canadian-Fairbanks-Morse Co., Ltd., Toronto Ont.

Maj. L. J. Campbell, a vice-president of the Youngstown Sheet and Tube Co., Youngstown, Ohio, has been assigned to the command of a battalion of heavy artillery at Camp Sherman, at Chillicothe, Ohio.

OBITUARY

CORNELIUS G. VAN ALLEN was stricken with paralysis on his seventy-first birthday, Sept. 25, and died in a short time. He was one of the prominent citizens of Northumberland, Pa., senior member of the firm of Van Allen & Co., and president of the Keystone Forging Co.

PAUL WESTPHAL, treasurer of the Wisconsin File Co., Milwaukee, Wis., died Oct. 11, after a long illness. He was 35 years of age.

Damages amounting to \$100,000 were caused at the Farrell, Pa., plant of the American Sheet & Tinplate Co., Sunday night, when the copperas plant, manufacturing a by-product, was destroyed by fire. A crossed electric wire is blamed for starting the blaze.

OFFICIALS ARE CRITICISED

Judge Talks Very Plainly in Decision in Labor Case

In an opinion handed down in United States District Court Oct. 9 at Cincinnati by United States District Judge Sater, the Niles-Bement-Pond Co., New York, owner of a majority of the stock of the Niles Tool Works Co., Hamilton, Ohio, is granted a temporary injunction directed against officers and members of Iron Molders' Union Locals Nos. 68 and 283, enjoining them from illegal interference with the plant or work of the Niles Tool Works Co. and molders employed by it to take the place of striking unionists.

In his opinion Judge Sater criticizes the conduct of city and county authorities in connection with disturbances growing out of the strike of molders in Hamilton, and suggests, if there is no law in Ohio providing for the ousting of officials for failure to perform duties imposed upon them by statute, such laws should be enacted. He criticized also officials of the unions and the Strike Committee for failure to prevent demonstrations against the employees and property of the Niles Tool Works.

Rights Are Defined

Outlining the rights of the respective parties, Court says in part:

"Labor has the right to strike. The strike sometimes is the only weapon laborers may wield to obtain their just deserts. The molders were at liberty to contend for the employment of union labor only at the tool company's plant, but the company has the right to run an open shop, without discrimination both union and non-union labor. The union men were not required to work for the company, but they had no right to say no one else should take their places.

"The right to form and join a union exists. The right to prevent another man from working, if he does not belong to the union, does not exist.

"This still is a free country. In the eyes of the law the rights of a union man are no higher or sacred than those of the non-union man. The rule of equality prevails. Whenever labor or capital resorts to discrimination, oppressive conduct or words or deeds of violence it discredits itself and weakens itself and invites the accompanying defeat which usually follows."

After reviewing the alleged acts of violence on the part of strikers and sympathizers and testimony given at the hearing of this case, touching upon the part taken by the city and county officials, Judge Sater wrote:

"A mob or an unlawful assemblage is a cowardly thing. If, in its formative period or even in its somewhat advanced stage, it be fearlessly taken in hand by courageous ministerial officers who have regard for their own efficiency and respect for the sanctity of their oaths of office, it almost always quickly melts away.

Officials Assume Responsibility

"Sheriffs and mayors and their subordinates are selected for and accept their positions to direct and do promptly just that kind of work, when occasion requires. There may be here and there a lawless, obstreperous person who will resist officers who thus perform their sworn duty, but these officers are authorized to meet resistance with force and with as much force as is necessary to subdue him and preserve the peace.

"Where the officers of the law are derelict of duty, as they were touching the matters here under consideration, many ordinarily well-disposed but sympathetic persons may follow vicious and evil-disposed leaders into subverting the law, endangering not merely the property but the liberty, limbs and life of others and rendering the preservation of order difficult and dangerous.

"It is always a grave reflection on peace officers when, on account of their dereliction of duty, citizens

of their community are forced to appeal to the courts to maintain the supremacy of the law and to give the protection such officers are bound by oath to afford. The ministerial arm can act more quickly and is no less powerful than that of the courts, and should be prudently, impartially and, if need be, vigorously employed.

"If the Ohio statutes do not sufficiently provide for the speedy and sure removal of such derelicts from office, amendments ought quickly to be made that such may be done."

NEW WAR TRADE BOARD

President Provides for Enforcing Trading with Enemy Act

WASHINGTON, Oct. 16.—The President, on Oct. 6, approved the trading with the enemy act, and by an executive order, signed Oct. 12, 1917, has established the administrative machinery to carry out its provisions. This act has conferred on the President war powers of the widest extent. It has added to the power to embargo all exports, which was conferred upon the President by the espionage act, the power to prohibit all imports into the United States except under such licenses as may be granted. It has conferred on the President the power to prohibit or regulate all transfers of credits, money, currency, bullion and securities between the United States and all foreign countries. It imposes severe criminal penalties on all persons who trade or communicate directly or indirectly with an "enemy," or "ally of enemy," or with any person acting on their behalf or for their benefit. It creates a definition of an "enemy" and "ally of enemy," with which it is highly important that every citizen of the United States should promptly familiarize himself for his own protection and for the loyal support of the Government in its efforts to wage the war to a successful termination. The act further provides for the use in the United States of enemy-held patents which may be of assistance to us in carrying on the war. It provides for taking over and administering the property in the United States of "enemies" and "allies of enemies." It confers upon the President complete power to censor all communications of every sort passing between this country and any foreign country. It provides certain regulations with regard to the foreign-language press in the United States. These are merely the broad outlines of the act, but it will readily be seen that the act confers power to deal effectively with the abnormal conditions of trade created by the war and the exigencies of the public safety. Certain of the powers conferred by the act the President has directed to be exercised through the State Department, the Treasury Department, the Attorney General, the Post Office Department, the Commerce Department, and the Federal Trade Commission. As to many of the powers conferred upon the President by Congress in this act, no single existing department is interested, and the President has provided for their joint administration by a War Trade Board composed of representatives of the departments which are most vitally concerned.

Members of the Board

The new War Trade Board so established is composed of Vance C. McCormick, chairman, as representative of the Secretary of State, a representative of the Secretary of the Treasurer to be appointed, Dr. Alonzo E. Taylor as representative of the Secretary of Agriculture, Thomas D. Jones as representative of the Secretary of Commerce, Beaver White as representative of the Food Administrator, Frank C. Munson as representative of the United States Shipping Board. Thomas L. Chadbourne, Jr., is counselor to the board. The functions and organization of this board are as follows:

The War Trade Board, under the President's direction, succeeds to all the functions which have been exercised by the Exports Administrative Board, which goes

out of existence. The proclamations of the President forbidding the export of various articles without a license are continued in full force and effect, but licenses will hereafter be granted by the War Trade Board instead of by the Exports Administrative Board, and all applications for such licenses, and all correspondence with regard to them, should be addressed to the Bureau of Exports of the War Trade Board. Its headquarters will for the present continue to be 1435 K Street, N. W., Washington.

Important Definitions

The definition of an "enemy" or "ally of enemy" requires careful consideration. In the first place, any person, no matter of what nationality, who resides within the territory of the German Empire or the territory of any of its allies, or that occupied by their military forces, is expressly made an "enemy" or "ally of enemy" by the act. Even citizens of the United States who have elected to remain within such territory are "enemies" or "allies of the enemy" within the provisions of the act. Further, any person not residing in the United States, of whatever nationality, and wherever he resides, who is doing business within such territory, is placed within the definition of "enemy" or "ally of enemy." So also is any corporation created by Germany or its allies. So also is any corporation created by any other nation than the United States and doing business within such territory. Further, for the purposes of this act, the government of any nation with which the United States is at war, or the ally of any such nation, and every subdivision of such government and every officer, official agent, or agency of such government, is an "enemy" or "ally of enemy," and the act makes no restriction as to where such officer, official agent or agency may be located.

It is important for the public to have clearly in mind that not only is it unlawful to trade with an "enemy" or "ally of enemy" without license, but it is equally unlawful to trade with any person whom there is reasonable cause to believe is acting for or on account of or for the benefit of an "enemy" or "ally of enemy," and it makes no difference what the nationality or what the residence of such person may be. On the other hand, in dealing with subjects of Germany who are resident in the United States, it is important to remember that while other provisions of the law make it possible to intern them, the mere fact of their nationality does not make them "enemies" within the meaning of this act and so prevent persons in this country from having ordinary commercial relations with them.

License to Trade with the Enemy

The Trading with the Enemy Act, however, while imposing such stringent provisions gives power to the President to grant licenses to trade with the enemy. The exercise of this power has been delegated by the President to the War Trade Board. Applications for license to trade with an "enemy" or "ally of enemy," or a person acting on behalf of or for the benefit of an "enemy" or "ally of enemy," should be sent to the War Trade Board.

In addition to the War Trade Board the President has created a War Trade Council, composed of the Secretary of State, the Secretary of the Treasury, the Secretary of Agriculture, the Secretary of Commerce, the Food Administrator, and the chairman of the United States Shipping Board. This War Trade Council will take the place of the Exports Council, and will act in an advisory capacity in such matters as may be referred to it by the President or the War Trade Board.

The act contains various provisions as to the applications for patents by citizens of the United States in enemy and ally or enemy countries during the war, and for the use in the United States by citizens of the United States of enemy-held patents during the war, and also for the suspension of information as to certain patent applications made in the United States, secrecy as to which is necessary for military reasons. The Federal Trade Commission is empowered by the President to deal with all these matters, receiving applications and granting licenses with regard to them.

Coal Production Increased

WASHINGTON, Oct. 16.—Coal production in this country this year will exceed that of last year by 10 per cent. The embargo against sending coal to Canada has been lifted and an arrangement made by which the Dominion is to be supplied on a pro rata basis, substantially as though it were a State of the Union. The American Northwest will be properly supplied.

These facts were developed at conferences held late last week by Federal Fuel Administrator Harry A. Garfield. Not only will this year's coal production exceed that of last year by 10 per cent, but it will exceed that of two years ago by 23½ per cent.

"The question of shortage for this year," said Dr. Garfield, "will depend then upon whether the American demand has increased by more than the 10 per cent increase in production. If our industrial development, from the war and other causes, has grown beyond that, then we must go short. We have no figures at hand to tell what that development has been."

Prof. Smith stated that the Survey figures include all bituminous coal, whether used in making coke or not, and that the figures for anthracite are approximately the same. Last year the bituminous tonnage mined was in excess of 502,000,000 tons. It is expected this year to reach 552,000,000 tons. Anthracite should show the same increase, substantially. America, according to Prof. Smith, is now nearly a month ahead of last year's production at this time.

Tata Iron & Steel Co. Preparing to Expand

YOUNGSTOWN, Oct. 15.—Serene labor conditions in Asia, where strikes and lockouts are unknown, and wages, due to the economical living of the natives in a warm country, at a minimum, will insure the rapid growth of the Tata Iron & Steel Co., located at Sakchi, India, stated G. H. Lee, an American representative of the corporation, while in Youngstown last Saturday looking after furnace equipment contracts at the plant of the W. B. Pollock Co.

Mr. Lee stated that native female labor, employed quite extensively in the Far East, is procurable at from four to six cents a day; unskilled male labor is paid approximately 10 and 12 cents a day, while skilled laborers are available at 50 cents a day. All that is required is great patience in dealing with the native labor, stated Mr. Lee. Maximum wages are paid experts from Great Britain and the United States whose principal duties are instructing the natives in steel making.

The Tata Iron & Steel Co. works built originally from plans prepared by Julian Kennedy of Pittsburgh, is planning to expand. Two blast furnaces, a plate mill and 150 by-product coke ovens have been contracted for. A third blast furnace will be erected later. Because of the admirable labor conditions promised for the India corporation, it is the opinion of Mr. Lee that the company will have no difficulty making money in normal times, or when there is a depression in other countries. In this thought the stockholders are encouraged by the cheap available native labor.

L. S. Phillips and James McClure, former Youngstown men who have been two years at the works of the Tata Iron & Steel Co., are expected back in the United States next February as their contracts expire some time in January, 1918.

Ferromanganese Imports Still Low in August

Ferromanganese imports in August were only 2840 gross tons which is next to the best month in the last four up to September but considerably below the previous war average and far less than the pre-war imports. In May, this year, when the sudden decrease started they were 2187 tons; in June, 3817 tons; in July, 2037 tons, and in August, 2840, making the average for these four months only 2220 tons per month. This contrasts with an average of 6190 tons per month for the first four months of this year and with 7577 tons per month in all of 1916. The pre-war average for five years, 1910 to 1914, was 100,793 tons per month.

Machinery Markets and News of the Works

COMMANDEERING BEGUN

Government Now Takes Freely Whatever Tools It Needs

Active Buying Continues for Ordnance Plants, Shipbuilding, Airplane Engine Work and Other War Necessities

The Government has tabulated complete records of machine tools on order in all of the leading factories of the country and is now exercising freely its right to commandeer through the granting of priority certificates, these certificates giving precedence to those engaged on important war work. It is said that efforts are being made in Washington to make up a schedule of all of the machinery requirements of the War and Navy departments for the next year in order to systematize the placing of priority orders.

The Fore River Shipbuilding Corporation, Quincy, Mass., which will build torpedo boat destroyers in a new plant being erected by the Government, will commandeer the tools it needs and its first efforts were directed this week toward getting equipment for a plate and angle shop, which will be located at Squantum, Mass. Buying will be done subsequently for the turbine machine shop at Buffalo, N. Y., and the boiler shop at Providence, R. I. The Aberthaw Construction Co., Boston, has begun work on the buildings and will purchase the necessary cranes, which, it is now reported, will number 70 or 80. About \$3,000,000 or more will be spent in equipping the three plants.

Buying for ordnance plants continues to feature the machine-tool markets. The Edgewater Steel Co., Pittsburgh, has issued a list of 58 large tools it will require for machining 9.5-in. and 155-mm. guns. A number of cranes will also be required. The Watertown Arsenal is about to buy and the Watervliet Arsenal will be in the market heavily in a week or two. The Symington-Anderson Co., Rochester, N. Y., which has a gun-machining contract, is buying additional tools. The Himoff Machine Co., Astoria, L. I., has a large contract for gun mounts, and is inquiring for machine-tool equipment. The American Gas Accumulator Co., Elizabeth, N. J., has a mine contract for which it is buying tools. The Blake & Knowles plant of the Worthington Pump & Machinery Corporation, East Cambridge, Mass., has bought about \$400,000 worth of new equipment for making pumps for the Navy.

The Compagnie Generale de Construction de Locomotives, H. Kampmann, 30 East Forty-second Street, New York, representative, is buying for a locomotive shop in France.

The Westinghouse Air Brake Co. will make airplane engines at its plant at Wilmerding, Pa., and is buying new equipment. The plant had been equipped for shell and fuse work when word was received from Washington to change to airplane engines. The Lincoln Motor Co., Detroit, has placed additional orders. The Ford Motor Co., Detroit, is buying. The Simplex Automobile Co., New Brunswick, N. J., is expected to issue a new list this week.

Buying in the New York market has been done by the Goulds Mfg. Co., Seneca Falls, N. Y., the Empire Cream Separator Co., Bloomfield, N. J., and a Japanese

shipbuilder, whose purchases of second-hand machinery aggregated \$75,000. The Monroe Calculating Machine Co., Orange, N. Y., is expected to buy soon.

The New York Central is inquiring for two tools and the Erie Railroad for one.

The American International Shipbuilding Corporation may provide for a larger fabricating shop at its Hog Island shipyard than was at first intended. This corporation continues an active buyer. It has just closed for a large number of locomotive cranes. The Submarine Boat Corporation and the Lackawanna Bridge Co., which are erecting a ship plant near Newark, are inquiring for five cranes. The New York Shipbuilding Corporation, Camden, N. J., and the William Cramp & Sons Ship & Engine Building Co., Philadelphia, are expected to buy for torpedo boat destroyer work. The Merchant Shipbuilding Corporation, Bristol, Pa., and the Chester Shipbuilding Co., Chester, Pa., are closing for a large number of new machines.

The Kemper Construction Co., Philadelphia, has a contract to furnish small parts for merchant ships and inquired last week for about 25 second-hand tools. It will also need a number of new engine lathes soon. The De Laval Steam Turbine Co., Trenton, N. J., is expected to buy equipment soon for work on turbines.

The Bartlett & Hayward Co., Baltimore, Md., is reported to have issued a list of large tools wanted for gun work. The Camden Forge Co., Camden, N. J., may buy gun-boring and turning machines. The North American Motors Co., Pottstown, Pa., has received bids on about 40 tools to be used on a 6-in. shell contract.

The Pennsylvania Railroad Co. continues to buy tools for a locomotive shop in France, having just closed for five bolt-cutting machines.

The Navy Department wants machines for the machine shops on several new battleships now building.

The Hess-Bright Mfg. Co., Philadelphia, will increase its capacity 25 per cent and will need new equipment.

The American Car & Foundry Co., Detroit, has closed for about 40 lathes and other machinery for a war contract.

An inquiry for 145 tools, reported from Cleveland last week, was issued by the Recording & Computing Co., Dayton, Ohio, and orders are now being closed. A leading Detroit automobile manufacturer has bought about 30 screw machines from a Cleveland maker. The Cleveland Tractor Co., which is enlarging its plant, has bought 15 turret lathes. An English order for 25 screw machines went to a Cleveland company. The Dayton-Wright Airplane Co., Dayton, Ohio, has placed additional orders.

General demand in Chicago is good. Planing machines are greatly needed. There is an inquiry also for large boring mills for gun mount construction. Large lathes with long beds for turning large old-style ordnance are also much sought. Sales at auction of used machinery in Chicago resulted in higher prices being paid than the machines cost when new.

The Tacony Ordnance Corporation, Tacony, Pa., has placed an order with the Chesapeake Iron Works, Baltimore, Md., for 13 electric traveling cranes, and the Morgan Engineering Co., Alliance, Ohio, received an order for a 60-ton ladle crane. The Badenhouser Co., Cornwells, Pa., has bought four 5-ton cranes. The Pennsylvania Railroad Co. is inquiring for jib cranes. Anderson, Meyer & Co., New York, are inquiring for two cranes for export to China. The General Electric Co. is in the market for several small cranes.

New York

NEW YORK, Oct. 16.

The Edgewater Steel Co., Pittsburgh, has sent to New York a list of large tools required for work on a Government gun contract. This company will machine some of the 9.5 in. forgings, which will be turned out at the new plant of the Tacony Ordnance Corporation, Tacony, Pa. It will also handle 155-mm. guns. Its list calls for two boring bar lathes, two cutting-off lathes, two heavy duty drill presses, two tool grinders, two test bar grinders, one heavy duty shaper, four cold saws, one heavy duty slotter, one centering machine, two test bar lathes, eight boring lathes for 9.5-in. guns, nine boring lathes for 155-mm. guns, eight turning lathes for 9.5-in. guns, five turning lathes for 155-mm. guns and nine planers. It is understood that a number of cranes will also be required for the gun work. The Edgewater Steel Co. is affiliated with the Kennedy-Stroh Corporation, Pittsburgh.

A number of machine-tool and machinery men were summoned to Boston on Monday by the Fore River Shipbuilding Corporation, which, it was said, would close orders this week for its plate and angle shop for torpedo boat destroyer construction. This shop will be located at Squantum, Mass. The boiler shop will be located at Providence, R. I., and the machine shop for turbines at Buffalo, N. Y. Buying for the two latter shops will be done soon. It is now reported that the contract of the Fore River Shipbuilding Corporation calls for the construction of 50 destroyers within 16 months. Work has already been begun on the buildings, which will be erected by the Aberthaw Construction Co., 8 Beacon Street, Boston. This company will also purchase the cranes for the buildings, of which possibly 70 or 80 will be required. The Fore River concern has been granted class A priority certificates by the Government and will commandeer the equipment it needs. It is said that the equipment of the plants will cost upward of \$3,000,000.

Buying continues active for ordnance and munitions plants. The Watertown Arsenal, Watertown, Mass., has sent out a large list and the Watervliet Arsenal, Watervliet, N. Y., is expected to buy heavily within a week or two. Among the requirements of the Watertown Arsenal are boring mills, milling machines and gun-turning lathes. The Symington-Anderson Co., Rochester, N. Y., which has a gun-machining contract, is buying. The Himoff Machine Co., Astoria, L. I., has obtained a large Government contract for gun mounts and will require a considerable number of new machine tools. The American Gas Accumulator Co., Elizabeth, N. J., has obtained a mine contract and is buying new equipment.

Purchases of the Blake & Knowles plant of the Worthington Pump & Machinery Corporation at East Cambridge, Mass., will aggregate about \$400,000. This factory has a large contract for pumps for the Navy Department.

The Compagnie Generale de Construction de Locomotives, represented by H. Kampmann, 30 East Forty-second Street, New York, is buying a complete equipment for a locomotive shop to be built in France. Early deliveries are not being insisted upon, six months to a year being requested in most instances.

Buying for the airplane engine industry continues. The Westinghouse Air Brake Co. will build 30 engines a day at its plant at Wilmerding, Pa., and is buying the necessary equipment. The plant was fully equipped for shell and fuse work, when an order was received from Washington to change to airplane engine construction. The Lincoln Motor Co., Detroit, has placed additional orders in the past week for its airplane engine plant. The Ford Motor Co., Detroit, has placed an order for a large number of grinding machines and is reported to be considering the purchase of other equipment. The International Motor Co., Plainfield, N. J., has bought additional tools in the past week. Nothing has yet developed from the inquiries of the General Vehicle Co., Long Island City, N. Y., or the Simplex Automobile Co., New Brunswick, N. J. The latter company is said to be trying to let sub-contracts for airplane engine parts and is expected to issue a new list of machine-tool requirements this week.

The Monroe Calculating Machine Co., Orange, N. J., which is building a new plant, has not yet purchased equipment for it, and is expected to come into the market soon for a number of new tools. The Goulds Mfg. Co., Seneca Falls, N. Y., continues to buy. The Empire Cream Separator Co., Bloomfield, N. J., is buying a number of tools.

Except for purchases by the Pennsylvania Railroad Co. for its Altoona shops some weeks ago, there has been so little railroad buying of late that an inquiry from the New York Central for two tools and from the Erie Railroad for one attracted more attention than they would perhaps otherwise have received.

A Japanese shipbuilder, through a representative in New

York, has bought second-hand machinery aggregating \$75,000 from several different companies. In most instances licenses were easily obtained, but the Government declined to grant a license for the exportation of a vertical boring drill.

The Chevrolet Motor Co. will move its engineering department and its purchasing office from Detroit to New York.

The Submarine Boat Corporation and the Lackawanna Bridge Co. are in the market for four 5-ton cranes, 58 ft. 2 in. span, and one 15-ton crane, 36 ft. 8 in. span, for the ship assembling plant they are erecting near Newark, N. J. Anderson, Meyer & Co., New York, are in the market for two cranes for export to China. The General Electric Co. wants three 3-ton cranes for the Schenectady works and one wall crane and one 3-ton traveling crane for its Pittsfield works. The J. G. White Engineering Corporation and the American Smelting & Refining Co., New York, are in the market for one hand-power crane each.

The Endicott Forging & Mfg. Co., Inc., Endicott, N. Y. has placed orders for two new 2800-lb. Chambersburg hammers and two Toledo presses.

The E. W. Bliss Co., Adams and Plymouth streets, Brooklyn, N. Y., has had plans prepared for the erection of a one-story brick addition to its works at Fifty-third Street near First Avenue, to cost about \$16,000.

The Automatic Trolley Lock Co., New York, has been incorporated with a capital of \$100,000 to manufacture special trolley locks and allied specialties. L. F. Roggenstein, H. D. Junge and J. M. Ruhl, 2426 University Avenue, Bronx, are the incorporators.

The Gotham Can Co., 60-68 Eagle Street, Brooklyn, manufacturer of tinware, has increased its capital from \$150,000 to \$500,000.

The Decorated Metal Mfg. Co., 196 Degraw Street, Brooklyn, manufacturer of tin boxes and metal specialties, is planning for the erection of a four-story addition.

The Amalgamated Oil-Gas Corporation, New York, has been incorporated with a capital of \$600,000 to manufacture gas-making machinery, coke ovens, engines, etc. A. E. Moore, 37 Wall Street, New York; A. F. McCabe, 19 Tompkins Place, and S. C. T. Dodd, 1918 Avenue H, Brooklyn, are the incorporators.

M. Kohner & Co., Brooklyn, have been incorporated with a capital of \$20,000 to manufacture motors, engines, etc. J. B. Stern and M. Kohner, 571 Forty-seventh Street, Brooklyn, are the principal incorporators.

The Drawn Metal Products Corporation, New York, has been incorporated with a capital of \$250,000 to manufacture metal goods. H. Osswald, C. A. Mezger and T. F. Crean, 359 Parkside Avenue, Brooklyn, are the incorporators.

The Ruggles Orientator Corporation of New York, New York, has been incorporated with a capital of \$100,000 to manufacture machinery and apparatus for the instruction of student aviators. A. C. Streitwolf, J. H. Leddy and W. G. Ruggles, 168 West Seventy-third Street, New York, are the incorporators.

The H. & N. Mfg. Co., New York, has been incorporated with a capital of \$325,000 to manufacture airplanes, motors, etc. The incorporators are J. B. Mooney, W. G. Decker and J. B. Mackie, 15 Wall Street, New York.

The Municipal Auto-Garage & Machine Corporation, Brooklyn, operating a plant at 26 Court Street, has increased its capital from \$10,000 to \$100,000.

The Speed Key Mfg. Co., Floral Park, L. I., has been incorporated with a capital of \$25,000 to manufacture typewriter speed keys. G. H. Locke, P. C. Locke and H. E. Frost, 382 St. Johns Place, Brooklyn, are the incorporators.

The New York Edison Co., 130 East Fifteenth Street, New York, will make extensions in its four-story power plant on First Avenue, to cost about \$7,000.

The Landau Machine & Drill Press Co., New York, has been incorporated with a capital of \$10,000 to manufacture multiple chuck drill presses. J. J. P. Mulcahey and J. N. Landau, 115 Broadway, are the incorporators.

The Latshaw Steel & Metal Products Corporation, New York, has been incorporated with a capital of \$100,000 to manufacture iron, steel and metal products. J. Taylor and V. and H. L. Latshaw, 220 Broadway, are the incorporators.

The Campbell Motor Car Co., New York, has been incorporated in Delaware with capital of \$3,000,000 to manufacture automobiles. L. H. Gunther, Joseph F. Curtin and Samuel B. Howard, New York, are the incorporators.

The North American Refining Co., New York, has been incorporated with a capital of \$10,000 to manufacture metal goods. J. Schulhofer and A. Isaacs, 150 East Fifth Street, are the incorporators.

The Braden Mfg. Co., New York, has been incorporated with a capital of \$20,000 to manufacture dies and tools.

The incorporators are D. A. Young and R. W. Braden, 135 West Third Street.

The International Dymalkon Process Corporation, New York, has been incorporated with a capital of \$500,000 to operate a general foundry and machine works. J. A. Poulin, E. O. Anderson and P. A. Stilwell, 38 Fort Washington Avenue, are the incorporators.

The Standard Self-Starter Co., New York, has been incorporated with a capital of \$10,000 to manufacture automobile self-starting devices. B. L. Darrow, J. L. Brulattour and J. J. Blemly, 441 West Thirty-fourth Street, are the incorporators.

E. Rothschild, Inc., New York has been incorporated with a capital of \$10,000 to manufacture electric clocks. A. L. Stock and E. and H. J. Rothschild, 277 West Fourth Street, are the incorporators.

The Motor Starter Corporation, New York, has been incorporated with a capital of \$2,000,000 to manufacture motor starting devices. S. W. Labrot, R. Delafield and S. McRoberts, 55 Wall Street, are the incorporators.

The Simmons Machine Co., 986 Broadway, Albany, N. Y., is having plans prepared for the erection of a one-story addition to cost about \$12,000.

The American General Electric Corporation of China, Schenectady, N. Y., has increased its capital from \$250,000 to \$500,000.

The Tottenville Shipyard Co., Monroe, N. Y., has been incorporated with a capital of \$100,000 to operate a ship-building plant with department for the manufacture of airplanes. J. A. Anderson, R. C. Baird and J. P. Pillow, 420 West 156th Street, New York, are the incorporators.

The Ross Vulcanizing & Battery Co., East First Street, Elmira, N. Y., will build a two-story addition to its plant, about 60 x 80 ft.

The Rome Electrical Co., Henry and Jay streets, Rome, N. Y., manufacturer of insulated wire, etc., has increased its capital from \$40,000 to \$300,000.

The Jamestown Iron & Metal Co., 201 Harrison Street, Jamestown, N. Y., has been incorporated with a capital of \$10,000 to manufacture iron and metal products. M. M. E. and A. L. Minsker, Jamestown, are the incorporators.

The New Idea Double Tire Co., 261 West Onon Street, Syracuse, N. Y., manufacturer of automobile tires, has increased its capital from \$5,000 to \$75,000.

The Atterbury Motor Car Co., Elmwood and Hertel avenues, Buffalo, manufacturer of automobiles, is planning for the erection of an addition to its plant.

The Rome Iron Mills, Inc., Rome, N. Y. has been reorganized with a capital stock of \$2,000,000. The business will be carried on with an active capital of \$500,000.

The Standard Aero Corporation, North Avenue, Plainfield, N. J., manufacturer of airplanes, is rushing improvements at the plant of the former John Stephenson Car Works, Elizabeth, recently acquired, and expects to occupy the plant before the end of the month. The initial output will average about 60 machines weekly.

The Banknote Press Co., Plainfield, N. J., has been incorporated with a capital of \$25,000 to manufacture printing machinery. George W. V. Moy, 125 East Front Street; Morris C. Van Arsdale and Harry W. Marshall, Plainfield, are the incorporators.

The J. D. B. Rubber Co., Arlington, N. J., has been incorporated with a capital of \$50,000 to manufacture rubber products. Alfred G. Berg, James H. Robertson and Benjamin A. Dare, all of New York, are the incorporators.

The Union Terminal Cold Storage Co., Twelfth and Henderson streets, Jersey City, N. J., is planning for the erection of a new cold storage plant, about 100 x 100 ft., on Thirteenth Street.

The Arthur Daniels Co., Jersey City, has been incorporated with a capital of \$10,000 to manufacture tools and machinery. Samuel Elfenbein, 38 Sherman Place, Jersey City, and Arthur Daniels, Bayside, L. I., are the principal incorporators.

The Barlow Foundry Co., 551 New Jersey Railroad Avenue, Newark, specializing in the production of gray iron castings, will build a new one-story brick and steel foundry, about 55 x 100 ft., on Hunter Street to cost \$20,000.

The Standard Machine Brush Co., Newark, has been incorporated with a capital of \$20,000 to manufacture brushes, etc. George H. Van Emburg, 462 Broad Street, and J. D. Gladwin, are the incorporators.

John Regner & Co., Newark, have been organized to operate a machine shop at 391-3 New York Avenue. John Regner heads the company.

The Universal Talking Toys Co., Newark, has been incorporated with a capital of \$60,000 to manufacture me-

chanical toys. Sylvester H. Williams and Frank S. Ely, Newark, and Richard S. Arthur, New York, are the incorporators.

The Art Metal Works, 7-15 Mulberry Street, Newark, manufacturer of metal specialties, has purchased a tract of land adjoining its plant and contemplates the construction of a series of buildings, providing an additional floor area of over 30,000 sq. ft. Louis V. Aronson is president.

The Specialty Machine Co., 9 Clinton Street, Newark, has been organized to manufacture automatic vending machines. Mortimer and Samuel Klein head the company.

The Little Janitor Clock Co., 16 Stuyvesant Avenue, Newark, has been organized to manufacture furnace clocks. William H. Weesel, 8 Richmond Street, and David H. Tillery, Newark, head the company.

The Kendall Foundry Co., Buffalo, brass founder, has acquired the property of the American Bronze Co., at Arthur Street and the Erie Railroad and commenced operations in the plant.

The Michigan Limestone & Chemical Co., Buffalo, has purchased a site on the Buffalo River at Katherine Street and the Erie Railroad on which it will erect a group of buildings for a crushing, grinding and chemical plant, including a machinery repair shop.

The Thomas-Morse Aeroplane Co., Ithaca, W. T. Thomas, president, has plans in preparation for a factory addition.

The Curtiss Aeroplane Corporation, Buffalo, is constructing a testing room at its Austin Street plant to cost \$10,000, also a steel test house to cost \$28,000 at its Elmwood Avenue plant, and a power-house.

The New York Central Railroad Co. is building a power plant to cost \$30,000 at Curtiss and Clarke streets, Buffalo.

The Wire Wheel Co. of America, Buffalo, H. F. Krause, manager, has plans in preparation for the construction of a new plant at Elmwood Avenue and the New York Central Railroad to manufacture wire wheels.

New England

Boston, Oct. 15

The Liberty Ordnance Co., Bridgeport, Conn., has been incorporated with authorized capital stock of \$4,000,000 to manufacture ordnance and munitions. The incorporators are Kenneth W. McNeil, Archibald McNeil, Jr., and Arthur L. Ruland.

The Fore River Shipbuilding Corporation has selected Providence, R. I., as a site for a boiler factory which will cost \$500,000 and employ about 800 men. The steel for the building is being assembled and it is the intention of the company to rush the structure as much as possible. The last big building of this kind constructed by the company was completed in 39 days and like expedition is expected in the completion of the Providence plant. The boiler house will be auxiliary to the big shipbuilding plant to be built on the Squantum Aviation Field, Quincy, Mass., where 46 torpedo boat destroyers will be constructed, and also to a \$2,500,000 turbine plant at Buffalo which will employ about 3500 men. It is the intention to have the Quincy plant completed by Jan. 15. The entire contract for the destroyers, the main plant, turbine and boiler plants calls for the expenditure of \$69,000,000.

The Stillman White Foundry Co., Providence, R. I., has awarded a contract for an addition, 26 x 40 ft., two stories.

The World Electric Machinery Co., Boston, has been incorporated with authorized capital stock of \$25,000. Max Freedman is president and Charles M. Waugh, Cambridge, treasurer.

The Burgess Co., Marblehead, Mass., has awarded a contract for a machine shop, 48 x 55 ft., two stories, and for a boiler house.

The Arkin Fastener Co., Boston, has been incorporated with authorized capital stock of \$10,000. Louis Arkin is president and Lella B. Clapp, Winthrop, treasurer.

The Lake Torpedo Boat Co., Bridgeport, has awarded a contract for a motor generator building, 30 x 36 ft., one story.

The Thomaston Business Men's Association, Thomaston, Conn., is to erect a factory to house a machine building company, controlled by Carl Holden and John Johnson of Waterbury. The name of the company is to be selected later, and plans for the building are being made.

The Forem Co., Providence, R. I., has been incorporated, with capital stock of \$15,000, to manufacture machinery and tools. The incorporators are Maurice W. Clarke, Joseph A. Barrett and Harry M. Friedman.

The New England Structural Co., Everett, Mass., has

awarded contracts for a tool shed, 40 x 60 ft., one story, and an office building, 12 x 70 ft., two stories.

The National Sales Machine Co., Boston, has been incorporated with authorized capital stock of \$1,500,000. The directors are Jose B. de Mass, president; Mary E. Hurley, 293 Concord Avenue, Belmont, treasurer; and William J. Denholm.

The G. S. Machine Tool Co., Pittsburg, Mass., has been incorporated with capital stock of \$25,000. William H. Savage is president and Robert D. Gould, treasurer.

Hunter & Havens, South Avenue, Bridgeport, manufacturers of wrought iron and steel products, have commenced the erection of a one-story addition, about 27 x 32 ft.

The Heppenstall Forge Co., Howard Avenue, Bridgeport, manufacturer of drop forgings, has commenced the construction of a one-story addition, about 60 x 360 ft.

Baer Brothers, Canal Street, Stamford, Conn., manufacturers of castings, etc., will build a new one and two story foundry, about 240 x 300 ft., on Fairfield Avenue.

The Waterbury Mfg. Co., Waterbury, Conn., manufacturer of brass goods, has commenced the construction of a six-story addition to cost about \$100,000.

The H. & H. Foundry Co., Stamford, Conn., manufacturer of iron castings, is building a one-story addition to its plant.

The American Machine Co., Pleasant View Street, Pawtucket, R. I., is building a one-story foundry extension, about 35 x 70 ft.

Philadelphia

PHILADELPHIA, Oct. 15.

Slow pay by manufacturers is causing complaint among the dealers. Tools which are sold on 30 days' time are frequently not paid for in several months, and in not a few instances dealers, much against their will, have been forced to accept notes on past-due obligations. The most solvent companies are declared to be the worst offenders.

Dealers also complain of discrimination against them in the Government purchasing departments in Washington as the result of an order issued some weeks ago which is said to have been particularly aimed at irresponsible brokers who were seeking Government business to make commissions from manufacturers. The order referred to directed that buying be done only from producers, and established machine-tool dealers resent the fact that some Government purchasing agents have construed this to apply to them also. In many instances factories have been obliged to conduct selling negotiations at Washington and later adjust profits with their Philadelphia agents, in whose territory Washington is located. Letters of protest have been sent to the Federal authorities and it is said have brought some promise of rectifying the alleged discrimination against the recognized dealers.

The American International Shipbuilding Corporation continues an active buyer for its Hog Island shipyard. It is reported that plans for fabricating steel sections for the ships to be built for the Emergency Fleet Corporation have not been carried out as successfully as was expected, and as a consequence a very much larger percentage of the fabricating will be done on the ground than was at first intended. If this proves true the corporation must buy considerable equipment for punching, shearing, bending and drilling operations on plates and shapes. A large order has been placed for locomotive cranes.

The New York Shipbuilding Corporation, Camden, N. J., and the William Cramp & Sons Ship & Engine Building Co., Philadelphia, which will expand their plants to build torpedo boat destroyers, are expected to come into the market shortly for a good deal of miscellaneous equipment. As an indication of the scope of the new work, it is stated that although the Cramp shipyard is now employing more than 6000 men, it will take on many additional to complete in record-breaking time the destroyers it has contracted to build.

The Merchant Shipbuilding Corporation, Bristol, Pa., and the Chester Shipbuilding Co., Chester, Pa., have closed for a large number of new machines, including about 30 for plate-working operations. The Pennsylvania Shipbuilding Co., Philadelphia, is expected to buy more equipment soon.

To supply small parts of various kinds for the new merchant fleet now building, the Kemper Construction Co., 905 Market Street, Philadelphia, which has been chiefly engaged in structural bridge construction, will equip a plant in this city. A factory building with 10,000 sq. ft. of floor space has been leased and work will be begun in 60 days on an initial Government contract aggregating \$500,000. The company is negotiating for a much larger order. Its machine-tool requirements include 14 engine lathes, eight drill presses, one heavy-duty drill press, four sensitive drills, four external grinders, and later additional engine lathes will be pur-

chased. Orders for most of this equipment were given this week.

The De Laval Steam Turbine Co., Trenton, N. J., is expecting a Government order for turbines for destroyers, upon receipt of which it is expected to buy a number of new tools.

The Camden Forge Co., Camden, N. J., is building a new forge shop, 100 x 500 ft., one story, which will be completed Jan. 1, doubling the capacity of the plant for marine shafting and locomotive work. The company has also been making gun forgings for the Japanese Government, and it is reported may undertake similar work for France, in which event the rough machining will also be done, and for which gun boring and turning lathes and similar heavy tools will be required. Six electric traveling cranes have been bought recently for the new shop, one 50-ton, one 15-ton, and two 10-ton bridge cranes and two 35-ton one-legged gantry type.

It is reported here that the Simplex Automobile Co. has received a Government contract for airplane engines and will this week issue a new list of machine tools to be bought, this list superseding one issued several weeks ago totaling about 100 tools.

The Bartlett & Hayward Co., Baltimore, Md., has issued a large list of tools to be used on gun-finishing work. The Poole Engineering & Machine Co., Baltimore, which has bought heavily in the past few weeks, will occupy a new building Dec. 15 with its gun-machining department.

The North American Motors Co., Pottstown, Pa., has received bids on machine tools needed for a 6-in. shell contract. Among the tools to be bought are 15 engine lathes, 16 turret lathes, 10 cutting-off machines and four grinders.

The Hess-Bright Mfg. Co., Philadelphia, will increase its capacity 25 per cent and is reported to be ready to buy a large number of tools.

The United States Navy is obtaining bids on tools for the machine shops on several battleships now building at various yards. The Frankford Arsenal, Philadelphia, will need considerable equipment for its new fuse plant.

The Pennsylvania Railroad Co.'s purchasing department is still buying machines for shipment to France, there to be used in the United States Government locomotive shop. Several bolt-cutting machines were purchased last week.

The Keystone Watch Case Co., Philadelphia, has discontinued the manufacture of fuses at its Ridgefield, N. J., factory, and has issued a printed list of several hundred second-hand tools which it is offering for sale.

The Tacony Ordnance Corporation, Tacony, Pa., has placed an order for 13 cranes, aggregating about \$125,000, with the Chesapeake Iron Works, Baltimore, Md., and with the Morgan Engineering Co., Alliance, Ohio, an order for one 60-ton ladle crane for its new gun-forging plant. The Badenhouser Co., Cornwells, Pa., manufacturer of water tube boilers, has closed with Alfred Box & Co., Philadelphia, for four 5-ton cranes, each 47 ft. 6 in. span. The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, is inquiring for jib cranes for an ash pit at Mt. Carbon, Pa.

The Tioga Iron & Steel Co., Fifty-second Street and Gray's Avenue, Philadelphia, manufacturer of iron and steel forgings, has acquired a tract of land on Fifty-first Street, adjoining its present works, for the construction of additions.

S. L. Allen & Co., Denkla Building, Philadelphia, manufacturers of agricultural implements and machinery, are taking bids for the erection of an addition to their plant at Fifth Street and Glenwood Avenue.

S. H. Davies, Philadelphia, has had plans prepared for the erection of a one-story, brick automobile repair shop, 40 x 70 ft., at Tenth and Tioga streets, to cost about \$6,000.

The Main Belting Co., 1241 Carpenter Street, Philadelphia, manufacturer of belting, is having plans prepared for the erection of a three-story brick and steel addition.

The Turbo Motors Co., Trenton, N. J., has been incorporated with a capital of \$100,000 to manufacture motors. W. Holt Apgar, 36 East State Street, Trenton; William McElroth, East Radford, Va.; and L. S. Randolph, Blacksburg, Va., are the incorporators.

The New York Shipbuilding Co., Camden, N. J., has filed plans for the construction of a one-story addition on Broadway, near Morgan Street.

Joseph Gaskill, receiver for the Camden Iron Works, Camden, has announced that he will continue the operation of the plant, following a failure to receive bids for the property late in September. It specializes in the production of cast iron pipe, hydraulic presses, etc., and will operate at full capacity. The company has assets estimated at over \$1,256,000.

The Jacob Wilson Estate, Easton, Pa., manufacturer of iron and steel castings, has commenced the erection of a new one-story foundry, about 60 x 100 ft., at Holly and Lehigh avenues, to cost \$35,000.

The Supreme Jack & Hoist Co., Williamsport, Pa., has been incorporated in Delaware with a capital of \$100,000 to manufacture hoists, tools and machinery. Henry J. Schmick, William J. Rouse and Alvin P. Huber, Williamsport, are the incorporators.

The Titan Metal Co., Bellefonte, Pa., is building a one-story addition to its plant, 60 x 200 ft., to cost about \$35,000.

The Bearings Company of America, Harrisburg and College avenues, Lancaster, Pa., has completed plans for the erection of a one-story addition, 36 x 120 ft., and will soon call for bids.

The Lanzius Aircraft Co., 149 Broadway, New York, a Delaware corporation capitalized at \$5,000,000, has secured land at Middletown, near Harrisburg, Pa., and plans the erection of a plant for the manufacture of airplanes, to be known as the Lanzius Improved Variable-Speed Airplane. The proposed works are estimated to cost \$250,000 and will have an initial capacity of 50 machines per month. The company is also contemplating the erection of other plants in different sections of the country. E. W. Bloomingdale is chairman of the board of directors.

The Pennsylvania Shipbuilding Corporation, Gloucester City, N. J., has increased its capital from \$1,000,000 to \$2,500,000. It is operating a local shipbuilding works and plans for an increase in capacity.

The Husted Hall Mould Works, Bridgeton, N. J., operating a plant at 38 Atlantic Street for the manufacture of machine molds, has been incorporated in Delaware, with capital of \$100,000, to manufacture dies, tools, machine molds and kindred products. Monroe G. Husted, John T. and Maurice R. Hall, Bridgeton, are the incorporators.

The American Brass Products Co., Pottstown, Pa., has acquired the plant of the International Forge Co., which it will continue to operate. Holland M. Merrick is president.

The Johnstown Traction Co., Johnstown, Pa., has commenced the erection of a new one-story car repair plant, 54 x 150 ft., to cost about \$10,000. George N. Smith is chief engineer.

The Wridgway Co., Scranton, Pa., manufacturer of pistons for airplane motors, is planning for the establishment of a new factory at Hazleton.

Baltimore

BALTIMORE, Oct. 15.

The American Propeller & Mfg. Co., 233-249 East Hamburg Street, Baltimore, which will build an addition to its plant, will increase its capital stock from \$150,000 to \$500,000.

The Pusey & Jones Co., Wilmington, Del., is contemplating the construction of a new foundry to cost about \$75,000.

The Payne Valve Corporation, Roanoke, Va., has taken over a building 60 x 100 ft. and will install machinery to manufacture automobile tire valves. S. G. Greene is the manager.

The Kendrick Aeroplane Co., Alexandria, Va., has been organized with Blaine Elkins, Washington, D. C., president.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., is contemplating additional improvements.

The Maryland Utilities Co., Crisfield, Md., has been incorporated with \$100,000 to generate electric power. The incorporators are Albert Emanuel, Louis A. Pettitt, Jr., and L. Paul Ewell.

The Southern Aircraft Co., Washington, D. C., has been incorporated in Delaware with capital of \$500,000 to manufacture airplanes. C. N. Riker, F. S. Swindell and W. J. Dow, Washington, are the incorporators.

The Electric Hose & Rubber Co., Twenty-first and Dure streets, Wilmington, Del., will make improvements and alterations in its plant to cost about \$20,000. C. D. Garretson is general manager.

The E. J. Codd Co., 600 South Caroline Street, Baltimore, will build a new one-story machine shop, about 60 x 74 ft., at Alleghanna and Spring streets.

Chicago

CHICAGO, Oct. 15.

An increased number of inquiries are coming from the East, many from dealers, and some business has resulted. This is taken to indicate the shortage of tools on the seaboard, and by some is believed to presage a heavier demand in this section. Sellers have no reason to complain, although in the past week buying by private companies has been somewhat lighter. Priority regulations continue to take machines here and there which originally were intended for delivery to non-war industries.

Planing machines are in such great demand that manufacturers have been looking around in the endeavor to locate shops which might undertake to build them on contract. Most of the machines wanted are large. One reason for the demand is that new field pieces for the army, made up to 6 in. in bore, are not round. Certain features of the recoil mechanism require that the gun be irregular in shape, with the result that the outside cannot be turned, but must be planed.

The building of large gun mounts, such as are used on submarine chasers, requires the use of large boring mills, and of these there is a scarcity also. A mount for a 4-in. gun requires a 72-in. mill.

Large lathes with long beds for turning large old-style ordnance are much sought. Heavy-duty milling machines are active, the others slow. Priority regulations are working smoothly, and dealers assert with considerable satisfaction that a way has been found for them to deal directly with the arsenals, instead of having transactions go through Washington. Instances are cited where one arsenal has placed orders by telegraph, the formalities coming later.

Trouble has been experienced in getting licenses to export to Russia, distrust being apparent as to the ultimate destination of certain tools wanted in that country. One result has been to cause the machines to be disposed of at home. Eighteen milling machines came on the market in that way.

The Simmons Machine Co., New York and Albany, N. Y., has inquired in this market for 100 18-in. x 8 ft. engine lathes. Lately there has been a superfluity of lathes with swing up to 20 in.

The equipment in the plant of the Drexel Motor Car Corporation, Chicago, including a large number of tools which have been in use less than a year, will be sold Oct. 24. The equipment of the Make A Motor Truck Co., Inc., Chicago, was sold at auction Oct. 12, the prices paid for some tools exceeding those paid when the machines were new. The business of the latter company consisted of converting Ford cars.

S. N. Crowen, architect, 30 North La Salle Street, Chicago, is taking bids on a one-story brick and stone factory, 163 x 234 ft., to be erected at Southport and Diversey avenues for the Nelson Mfg. Co., which will contain a machine shop and enameling and case-hardening departments.

Contracts have been let by S. N. Crowen, architect, for a one and two-story mill construction factory, 60 x 213 ft. at 5730-5736 West Twelfth Street, Chicago, for O. C. Huffman, president United States Can Co., Cincinnati. This will be the first unit of a large factory.

Bids have been taken by Leittelt Brothers, Inc., 7731 South Chicago Avenue, Chicago, for a one-story factory addition, 46 x 77 ft., to cost \$6,000.

The Acme Steel Goods Co., 2716 Farrell Street, Chicago, will build a four-story factory, 100 x 105 ft., to cost \$60,000.

The Goodman Mfg. Co., 4832 South Halsted Street, Chicago, will build a one-story addition, 36 x 124, at a cost of \$10,000.

The Lasker Iron Works, 1849 West Thirty-third Street, Chicago, has secured a permit for a shop addition, 30 x 40 ft., which will cost \$5,000.

The International Harvester Co. has purchased approximately 12 acres in the Notre Dame addition to South Chicago to provide for future needs.

The first unit of the Great Western Smelting & Refining Co., which recently purchased 25 acres at Whiting, will consist of a foundry, 100 x 100 ft., to cost about \$60,000. The ultimate expenditure will be several hundred thousand dollars.

The American Machine & Tool Co., Chicago, has been incorporated with a capital stock of \$25,000 by Carl D. Swanson, Joseph Richer and Ernest E. Eklund.

The Bradford Sales Co., Peoria, Ill., has been incorporated with a capital stock of \$25,000 by J. S. C. F. and H. S. Bradford to manufacture automobile parts.

The Weaver Mfg. Co., 2171 South Ninth Street, Springfield, Ill., will erect a one-story addition to its factory which will contain 2000 sq. ft. and cost about \$12,000. New machinery will be purchased. The company manufactures automobile repair machinery.

The Illinois Central Railroad will build a roundhouse to cost \$60,000 at Mattoon, Ill., and a similar building at Kankakee.

G. W. Cushman, Champaign, Ill., has received bids for an addition to his machine shop, 60 x 150 ft.

The forging and boring departments of the Hart-Parr Co., Charles City, Iowa, were destroyed by fire Oct. 10. The company has both British and United States war orders, largely ship work.

The Blackhawk Airplane Co., Davenport, Iowa, has been

incorporated in Delaware with capital of \$100,000 by D. R. and J. R. Lane and C. V. Dart.

The S. & S. Steam Superheater Co., Chicago, has been incorporated in Delaware with capital of \$100,000 to manufacture superheaters and boilers. John C. Smith and Philip Sulton, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Oct. 15.

Orders for machine tools continue to be placed in the local market at a rate which shows no slackening in demand. Requirements of milling machines are so broad that makers are working night and day and still are unable to catch up on deliveries. While the supply of both skilled and unskilled labor is inadequate, not much complaint is heard. Many men employed in shops devoting only part capacity to Government work are seeking positions in industries which are entirely occupied with such contracts, due to the desire for security under the conscription act and also to obtain increased wages.

Dealers in light tools report a steady demand from garages and small machine shops which are being erected or established in large numbers.

The G. W. Jones Lumber Co., Appleton, Wis., has plans for a new planing mill, with a 150-hp. Corliss steam generating plant, to be erected in connection with its sawmill at Wabeno, Wis., at an estimated cost of \$40,000.

The Menasha Paper Co., Menasha, Wis., will build a two-story paper mill, 42 x 200 ft., at Ladysmith, Wis., at a cost of \$75,000.

The Record Needle & Mfg. Co., Milwaukee, has been incorporated with a capital stock of \$75,000 by interests affiliated with the Badger Talking Machine Co., 135 Second Street, to manufacture needles and other talking-machine accessories. Details will be announced later. George F. Ruez is president.

The Jenkins Machine Co., Sheboygan, Wis., manufacturer of saw and planing mill and general wood-working machinery and equipment, has purchased the plant and business of the Pribnow Swage & Tool Works, Mellen, Wis., and will consolidate the plant in Sheboygan. The Pribnow company's line of sawmill specialties will be continued on a much enlarged scale.

The Rhinelander Refrigerator Co., Rhinelander, Wis., manufacturer of ice-boxes and refrigerating plants, has increased its capital stock from \$50,000 to \$100,000 to accommodate the growth of its business.

The Jorgenson Mfg. Co., Waupaca, Wis., incorporated with a capital stock of \$70,000, has taken a lease, with the option of purchase, of the factory and water power of the Waupaca Felting Mills, and is buying machinery and equipment for the manufacture of gas engine primers, carburetors and other automobile accessories. The officers are: President, J. P. Jorgenson; vice-president, Julius Jorgenson; secretary-treasurer, C. A. Jorgenson.

The Hamilton Mfg. Co., Two Rivers, Wis., which recently purchased the Chester, Pa., steel furniture plant of the Keystone Type Foundry Co., Philadelphia, announces that reports that it will consolidate the plant with the main works at Two Rivers are incorrect. It has a long-term lease of the Chester plant.

The Electrical Construction Co., Racine, Wis., has been incorporated with a capital stock of \$18,000 by Charles F. Brietzke, William B. Pierce, and others.

The Crank Shaft Valve Movement Corporation, Green Bay, Wis., incorporated with \$300,000 capital, has perfected its organization and elected the following officers: President, Jules Gerard; vice-president, Sylvester Duquaine; secretary, William Cook; treasurer, A. L. Cannard; general manager, W. V. Leppla, Escanaba, Mich. Plans for establishing a small plant and an experimental shop are now being completed. A gearless internal combustion engine will be manufactured.

The Ajax Frog & Switch Co., Blue Island, Ill., expects to start operations in its new plant at Superior, Wis., by Nov. 1. The main building is 120 x 200 ft., divided into a forge shop, 50 x 80 ft.; boiler room, 35 x 35 ft.; office, 25 x 40 ft.; machine-shop, 25 x 45 ft. It will manufacture intricate railroad specialties.

The Laursen Automatic Pump Co., Menomonie, Wis., at a special meeting of stockholders, authorized the directors to proceed with the production of an improved type of pump, recently perfected.

The Wisconsin Duplex Auto Co., Clintonville, Wis., incorporated several months ago with a capital stock of \$500,000, expects soon to make a definite decision concerning the establishment of its proposed new plant. The company

has been doing experimental work in connection with the Andrews Motor Mfg. Co., 834 Muskego Avenue, Milwaukee, for several months and may take over that plant. It will manufacture passenger and commercial cars with a duplex transmission system. William A. Besserdich is president and general manager.

The Terra Aluminum Co., Waukesha, Wis., will build a new one-story addition to its plant at Mishawaka, Ind., about 70 x 90 ft. The company is planning for the removal of its plant to the new location.

Detroit

DETROIT, Oct. 15.

The machine tool market in this section continues to improve and more sales were made the past week than for several months. The American Car & Foundry Co. placed an order for 40 Wickes lathes and considerable other machinery, believed to be for a large war order recently received. Numerous other orders and inquiries have made the market unusually strong.

Deliveries remain about the same, although lathes are easier to obtain. Milling machines and certain kinds of drilling machines are very difficult to secure.

Labor is well employed at high wages and no trouble is anticipated.

It is reported that the Ross Automobile Co., Detroit, contemplates removing to an Eastern city. H. D. Mackay is general manager.

N. D. Rutherford, Findlay, Ohio, manufacturer of the Dairy Maid milking machine, will locate his factory in Saginaw, Mich.

The Allegheny Forging Co., a Pennsylvania company which recently bought the Emergency Drop Forge plant, Lansing, Mich., will expend nearly \$50,000 in overhauling and re-equipping the building. Work is now being pushed. John Bell, formerly with the Seager Co., is temporarily in charge of the plant.

The Lewis Mfg. Co., Bay City, Mich., has started the erection of an addition to its plant on Twenty-third Street.

The Barnes Foundry & Mfg. Co., Detroit, announces that the first unit of its new plant will shortly be constructed. It recently purchased 31 acres, of which the first unit will occupy about one-third of the property and will represent an investment of \$350,000. Gray iron castings for cylinders, pistons and airplane motor cylinders will be manufactured. Claire L. Barnes is president; George W. Smith, vice-president, and Charles E. Pelton, secretary and treasurer.

The Haskell Mfg. Co., Ludington, Mich., has decided to make an additional investment of \$1,000,000 in new buildings and machinery for construction of veneer parts for airplanes. Government contracts have been secured and the company plans to employ 3000 men as soon as facilities are available.

The Karo Carburetor Co., Alma, Mich., will triple the size of its plant to take care of a contract received by the Western Carburetor Co. for its entire output up to 200 carburetors per day.

Negotiations are under way for the location in St. Clair, Mich., of the Harrow Tractor Co. A building 60 x 100 ft. will be erected. At present only assembling will be done.

Permits have been granted to the Chevrolet Motor Co., Flint, Mich., for a factory to cost \$100,000 and additions to cost \$30,000.

The McCord Mfg. Co., East Grand Boulevard, Detroit, manufacturer of railroad specialties, is building a new one-story machine shop, about 40 x 80 ft.

Cleveland

CLEVELAND, Oct. 15.

The demand for machinery continues heavy, largely for munition, airplane and motor truck work. The inquiry noted in this section last week for 145 machines is from the Recording & Computing Co., Dayton, which is now placing orders, having purchased 37 screw machines and other equipment. A leading Detroit automobile manufacturer placed an order in Cleveland the past week for 50 screw machines. The Cleveland Tractor Co., which is enlarging its plant, placed orders for 15 turret lathes. A British order for 25 screw machines was given to a Cleveland maker. Orders for additional equipment were placed in this market by the Dayton Wright Airplane Co., Dayton. No large new inquiries came out the past week, but machinery houses report a good demand for small lots of tools. Efforts are being made in Washington to make up a schedule of all the machinery requirements of the War and Navy departments for the next 12 months, to systematize the purchase of equip-

ment and to assure the placing of priority orders for which the earliest delivery is required.

G. F. Mitchell & Son, Cleveland, makers of sheet metal products, have acquired a six-acre site on the Nickel Plate Railroad and London Road, on which they contemplate the erection of a new plant, having outgrown their present quarters on Cedar Avenue. Six 50-ft. one-story units each 300 ft. in length with saw tooth roof will be built.

The Ohio Blower Co., Cleveland, has commenced the erection of its new branch plant at Orville, Ohio, which includes a foundry, 100 x 100 ft., and a machine shop, 60 x 200 ft., to be used for the manufacture of its steel specialties.

The Economy Machine Co. is the name of a new Cleveland company that is building a plant on East Fifty-fifth Street near the Taylor-Boggis Foundry Co. to do jobbing machine work. David Kraus is manager.

The Lake Erie Dry Dock & Engineering Co., Sandusky, Ohio, has been formed with a capital stock of \$1,600,000 to take over the plant of the Lake Erie Dry Dock & Mill Co. and probably other plants of that city. Charles Bright and others are interested in the new company, which, it is stated, will engage in shipbuilding work.

The Universal Machine Co., Bowling Green, Ohio, is erecting two buildings, each 55 x 85 ft., which when completed will add 40 per cent to the present floor space.

The Niles Forge & Mfg. Co., Niles, Ohio, has increased its capital stock from \$30,000 to \$80,000. It is stated that manufacturing facilities will be increased.

The Aristos Co., Warren, Ohio, has been incorporated with a capital stock of \$50,000 by Fred T. Petrel, Paul A. Homer, and others, to manufacture vapor plugs for automobiles.

Specifications will be issued shortly for machine shop, foundry, forging, sheet metal, wood-working and electrical equipment for the manual training department of the Lakewood, Ohio, schools, amounting to \$100,000. R. L. Short, director of high schools, Lakewood, can be addressed. Delivery is wanted by August, 1918.

The Fairmont Tool & Forge Co., Cleveland, recently incorporated with a capital stock of \$100,000, will establish a plant at 165th Street and Quincy Avenue to manufacture airplane parts and tools. J. Wentworth Smith is president; Charles W. Yarham, general manager, and B. G. Gilmore, sales manager.

The American Tool & Mfg. Co., Urbana, Ohio, is about to move into its new plant, 60 x 120 ft., with office building adjoining. P. J. Schneider is manager and H. P. Creighton superintendent and treasurer.

The Williams Foundry & Machine Co., Akron, Ohio, recently reorganized, has increased its capital to \$2,500,000.

The Semi-Steel Foundry Co., Barberton, Ohio, has commenced the construction of a new brick and steel foundry and machine shop to cost about \$100,000.

Cincinnati

CINCINNATI, Oct. 15.

Machine tool dealers are receiving a number of inquiries from small manufacturing companies, which is considered an encouraging sign for future domestic business. For some time there has been a very scant inquiry for machine tools from this source. Machine tool builders are figuring on a large number of machines needed by munition makers, shipbuilders, and the Government. The general rule now is to issue a list of specifications for machines that the manufacturer can furnish and not send a complete list covering everything required.

There is no let-up in inquiries for export and purchases are quietly made that rarely come to light. Orders have lately been received for machine tools for Japan, while Spanish and Italian purchases depend upon the ability of manufacturers to make deliveries. On account of the present conditions in the machine tool trade, it is expected that the coming convention of the National Machine Tool Builders' Association, to be held in New York this month, will be attended by a large number of machine tool builders from the Central West.

The Peters-Bossert Co., Cincinnati, has been incorporated with \$75,000 capital stock by J. W. Heintzmann, J. Sagmeister, William E. Hess, M. W. Ostendorf and A. Mannion. It operates a jobbing machine shop at Front and Culvert Streets, the capacity of which will be increased to manufacture special machine tool parts.

The National Oxygen Co., Cincinnati, has removed its plant from 3240 Spring Grove Avenue to 4600 Spring Grove Avenue, Winton Place. A. J. Chinn is president.

The Cincinnati Grinder Co., Cincinnati, advises that it expects to occupy its new plant on Colerain Avenue before Nov. 15.

The Wadsworth Watch Case Co., Dayton, Ky., has been incorporated with \$150,000 capital stock by H. A. Wadsworth, and others. It is reported that the company intends enlarging its plant at an early date.

The Independent Pipe Co., Springfield, Ohio, is equipping a plant for the manufacture of sewer pipe to be constructed of reinforced concrete.

The Oliver Superior Glass Co., Westerville, Ohio, has been incorporated with \$100,000 capital stock to erect a plant for the manufacture of automobile lenses and other specialties. T. C. Tussey is secretary.

The Automatic Circuit Breaker Co., 153 North High Street, Columbus, Ohio, is remodeling a two-story building at Sixth Street and Wesley Avenue in which will be installed equipment to manufacture an electrical specialty.

The National Electric & Construction Co., Mansfield, Ohio, has been incorporated with \$10,000 capital stock by Frank Mattox, and others.

The Automatic Electric Devices Co. and the Simplex Controller Co., Cincinnati, have been incorporated with \$10,000 and \$5,000 capital stock by Clarence E. Ogden, and others, to manufacture electric specialties. The companies will fit up a joint plant and later will need two 14 or 16-in. lathes, a drill press and other machines. The executive offices are at 515 Mercantile Library Building.

Indianapolis

INDIANAPOLIS, Oct. 15.

The H. Clauss Cutlery Co., Tipton, Ind., has been incorporated with \$100,000 capital stock to manufacture machinery, tools and equipment. The directors are B. H. Adler, Lee F. Griffith, Henrie Clauss, G. D. Krebs and H. R. Adler.

The American Appliance Co., Indianapolis, has increased its capital stock from \$40,000 to \$150,000.

The Arc-Flame Mfg. Co., recently organized at Jeffersonville, Ind., will manufacture the Dorsey hydro-carbon fuel-burning apparatus, a burner for coal oil.

The Standard Electric Co., Indianapolis, recently organized with \$500,000 capital stock, will build a plant at Noblesville, Ind. The directors are E. C. Applegate, administrative head of the Founders Syndicate, who is president and treasurer; D. H. Duncan, formerly connected with the National Motor Co., vice-president and factory manager, and Henry Bartlett, expert electrician with the Merchants Heat & Light Co.

The T. C. Ross Mfg. Co., Indianapolis, has been incorporated with \$25,000 capital stock to manufacture car fenders and machinery. The directors are T. C. and C. L. Ross and James Wilson.

The Central Plating & Mfg. Co., Indianapolis, has increased its capital stock from \$10,000 to \$30,000.

The A. T. S. D. Mfg. Co., Michigan City, Ind., has been incorporated with \$10,000 capital stock to manufacture machinery. The directors are Claude N. Allen, J. C. Lyons and George E. Malone.

The Crowley Building Block & Mold Co., Kokomo, Ind., has been incorporated with \$15,000 to manufacture building blocks. The directors are James F. and Claude S. Crowley and James H. Warwick.

The Kant Freeze Radiator Cover Co., Anderson, Ind., has been incorporated with \$20,000 capital stock to manufacture automobile radiator equipment. The directors are Allen C. Shimmer, William J. Norton and Charles T. Norton.

The Corbin Folding Chair Attachment Co., South Bend, Ind., has been incorporated with \$25,000 capital stock to manufacture furniture. The directors are J. A. Hull, Frank J. Cosgrove and F. A. Hull.

The Central South

LOUISVILLE, Oct. 15.

Some slackening in demand is reported by manufacturers and distributors of machinery, attributed to a disposition to await developments. Wood-working equipment is showing considerable activity. Coal and coke are difficult to obtain and efforts to accumulate reserve supplies have not been very successful. Labor continues scarce and in some cases demands for advances have been made.

The Henry Vogt Machine Co., Louisville, is building a new boiler house and will replace existing boilers with two of 500 hp.

The Embry Box Co., Louisville, which recently purchased a factory for \$50,000, will be in the market for wood-working and box-making machines. The new plant will be equipped for individual motor drive.

The Wakefield Harrow Co., Lewisburg, Tenn., has been

incorporated with capital stock of \$10,000 by J. W. Wakefield, C. C. Houston, P. B. Houston, Jr., J. P. Fitzpatrick and E. E. Murray, to manufacture farm implements.

St. Louis

ST. LOUIS, Oct. 15.

The Hope Cotton Compress Co., Hope, Ark., organized with capital of \$100,000, has purchased the plant of the St. Louis Compress Co., and will add considerable equipment. J. P. Brundidge is president.

Wapanucka, Okla., will add about \$6,000 worth of equipment to its electric station.

The Pelican Well Tool & Supply Co., Shreveport, La., will install forge shop and steam hammer equipment.

The Duplex Oil & Refining Co., Cushing, Okla., Herman F. Grim, and others interested, will equip a plant requiring an investment of about \$500,000.

The Burlington Oil & Refining Co., Oklahoma City, Okla., has been incorporated with a capital stock of \$1,000,000 by H. W. Ferguson of Oklahoma City, Okla.; W. D. King and R. R. Sims of Frederick, Okla., and will establish a plant.

The Humphreys Pipe Line Co., Tulsa, Okla., has been incorporated with a capital of \$500,000 by John B. Means, and others, and will install oil pumping stations, etc.

The department of public property, Thomas L. Willis, engineer, New Orleans, La., will equip a garbage reduction and grease recovery plant to cost \$1,250,000 to \$2,000,000.

The Fortier Electric Mfg. Co., Tulsa, Okla., U. D. Fortier, manager, and W. N. Sill, president, is in the market for equipment for the establishment of a plant to manufacture time switches, electric washing machines and other devices.

The International Shipbuilding Co., Pascagoula, Miss., has purchased land for additions and is in the market for equipment.

Joplin, Mo., has voted \$100,000 for waterworks plant equipment. J. J. McAfee is city engineer.

The plants of the William Carter Lumber Co. and the Baldwin Mill Works, Laurel, Miss., have been burned with a loss of about \$125,000. They will be rebuilt.

The Vicksburg, Shreveport & Pacific Railroad, Vicksburg, Miss., is planning for the erection of new shop buildings at Monroe, La., to include a one-story machine shop, 100 x 120 ft., and seven-stall roundhouse. An overhead electric crane, locomotive hoist and other equipment will be installed.

The Coal Oil Manifold Co., St. Louis, has been incorporated with a capital of \$10,000 to manufacture kerosene engines, manifolds, etc. R. W. Morrison, W. S. McCall and Edward H. Gorse, St. Louis, are the incorporators.

The Coast Ship Co., Biloxi, Miss., recently incorporated with a capital of \$100,000, has acquired a site on Back Bay for its proposed shipbuilding plant, which will be devoted to the construction of vessels of 2000 tons capacity and give employment to about 500. D. J. Gay is president.

Texas

AUSTIN, Oct. 13.

Dealers report an improvement in the demand for machinery and machine tools. An unusual number of manufacturing plants being built and are in prospect which will require the installation of heavy machinery. Mexico is expected to be an active purchaser this fall.

The Davis Mfg. Co., Deming, N. M., has been incorporated and will build a plant to manufacture a machine for cutting wild vegetation.

The Humble Oil Co., Houston, has purchased the refinery of the Dixie Oil Co., San Antonio, for \$550,000 and will install additional machinery and enlarge the plant.

Snowflake & Taylor, Snowflake, Ariz., are having plans prepared for a hydroelectric plant to cost about \$50,000.

Smith & Townes, architects, Amarillo, are preparing plans and specifications for the proposed manufacturing plant to be built at Texico at a cost of about \$10,000,000. It is stated that construction will be started as soon as the plans are finished.

The Houston & Brazos Valley Railroad will install new machinery, including a large crude oil engine, in its shops at Velasco.

The Gulf, Colorado & Santa Fe Railroad has appropriated \$26,969 for the purchase of shop machinery and other improvements at Galveston.

The Wier Lumber Co., Wiergate, will install considerable machinery in the new lumber mill which it is constructing.

The Atchison, Topeka & Santa Fe Railroad plans to install additional machinery and enlarge its shops at Clovis, N. M.,

which, with other contemplated improvements, will cost about \$100,000.

C. A. Robertson, Texico, is promoting the organization of a company with a capital stock of \$10,000,000 to erect a plant at that place for the manufacture of automobiles and farm tractors.

Waco will construct a sewage disposal plant at a cost of about \$182,000. P. Trevino, San Antonio, is engineer.

The Houston Compress Co., Houston, has been incorporated with a capital stock of \$300,000. M. D. Anderson is a stockholder.

California

LOS ANGELES, Oct. 2.

The Santa Fe Railroad, Los Angeles, is said to be planning for the erection of additions to its shops at Clovis, N. M., at an estimated cost of about \$50,000.

In addition to power plants, the Southern California Edison Co., 120 East Fourth Street, Los Angeles, will build two new electric generating stations at Huntington Lake. The proposed power plants are estimated to cost about \$2,000,000, including development work in connection with the projects.

In connection with its new shipbuilding works at San Diego, the United States Steel Shipbuilding Co., Los Angeles, will establish a department to build airplanes. Benjamin F. Graham heads the company.

The DeLion Tire & Rubber Co., Los Angeles, has been incorporated with a capital of \$50,000 by J. W. Luther, A. L. Bartlett and J. E. Geyer.

The Sierra & San Francisco Power Co., Oakdale, is planning for the construction of an addition to its electric power plant at Stanislaus to double the present capacity and estimated to cost about \$1,000,000. H. F. Jackson is general manager.

The C. H. Sharp Mfg. Co., Los Angeles, manufacturer of heating furnaces and systems, has removed its office from 1312 East Twelfth Street to 210 West Eleventh Street.

The Pacific Northwest

PORTLAND, ORE., Oct. 9.

Demand from lumber mills and small machine and automobile repair shops shows some increase, but the shipbuilding industry is held up to some extent by the labor situation. The lack of definite information from the East as to the effect on machinery of Government prices of steel products and the unwillingness of machinery houses in this section to make lower prices without this information is believed to have held up considerable new business.

Portland is in the market for four pumps, two with a daily capacity of 1,000,000 gal., and two with a daily capacity of 500,000 gal., together with motors and other electrical equipment.

The Standard Machine Works, Stanwood, Wash., has been sold to Gilbertson & Bergerson by M. H. and F. Olney.

The Oregon Shipbuilding Co., Portland, has dissolved and consolidated with the Motorship Construction Co.

The National Steel Construction Co., Seattle, will add to its wooden shipbuilding plant equipment to manufacture steel vessels at a cost of about \$75,000. The enlargements will include a two-story boiler house, 60 x 250 ft.; storage shed, 60 x 200 ft., and a blacksmith shop.

The Whalen Pulp & Paper Co., Vancouver, B. C., will equip shipbuilding yards at Quatsino, on Vancouver Island, for building wooden ships for its own use.

The Sound Paper Co., Seattle, is considering sites at Everett and on Lake Washington, on which it will build a paper mill with daily capacity of 400 tons to cost \$6,000,000. A hydroelectric plant will be constructed at a cost of \$3,000,000.

A. A. Haskin, Hoquiam, Wash., and associates have formed the U. S. Aerospeed Co. and plan the establishment of a plant to manufacture airplanes.

The Olympic Steel Works, Seattle, has recently completed the installation of machinery at its plant on the Canal Waterway, which will have a daily capacity of 1000 lb. of steel castings.

The Huffschtmidt-Dugan Iron Works, Bend, Ore., plans the construction of an addition to its foundry to cost \$5,000. New equipment will be purchased.

The Doran Brothers Machine Co., Seattle, contemplates increasing the capacity of its plant more than 20 per cent. at a cost of \$15,000. Its facilities were recently doubled by the construction of a new foundry.

The Seattle Can Co., Seattle, has leased a block at Ninth

Avenue South and Nevada Street on which it will make additions to its plant.

Canada

Toronto, Oct. 15.

The shipbuilding plant on the Niagara River, near Bridenburgh, Ont., which has been closed for several years, will soon be put in operation by the Canadian Allis-Chalmers Co., King and Simcoe streets, Toronto, the holding company of the Canada Foundry Co., Toronto, which has owned the plant for the past 10 years. Steel ships of the size to pass through the Welland Canal will be constructed. A force of men will be put to work at once in order to get the yards ready for ship construction at an early date. The plant was constructed in 1903 by the now defunct Canadian Shipbuilding Co. and comprises about 200 acres. Some additional shipbuilding machinery will be purchased.

The Arnprior Cabinet Co., Ltd., Arnprior, Ont., has been incorporated with a capital stock of \$100,000 by Daniel O'Connell, Robert J. Simpson, Bertrand T. McAvoy, Agnes Beverly, 17 Westminster Avenue, and others, to manufacture office furniture, cabinets, fittings, etc.

The International Rubber Goods, Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by James F. Lee, 15 Kendal Avenue; Donald F. Johnston, Albert E. Ashman, and others, to manufacture automobiles, machinery, engines, tractors, rubber goods, etc.

The York Electric Co., Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by Dyce W. Saunders, 71 Bay Street; Stanley S. Mills, Paul Home, and others, to carry on the business of electrical engineers and to manufacture electrical and mechanical machinery and equipment, etc.

The R. Bell Engine & Thresher Co., Seaforth, Ont., is in the market for a 30 to 50-hp. electric motor, 25-cycle, three-phase, 220 volts, 750 r.p.m.

The Crescent Concrete Co., Toronto, has been awarded contract for an addition to the machine shop of the Willys-Overland Co., Weston Road, Toronto, to cost \$8,000.

The City Council, Hamilton, will purchase additional steam pumping equipment at a cost of \$159,000. Charles G. Booker is chairman.

St. Thomas, Ont., will build a sewage disposal plant to cost \$7,500. Construction will be commenced at an early date.

The St. Lawrence Welding Co., Montreal, has opened its new brass foundry at 39 Oiler Street. The plant is equipped with the latest requirements and the production of castings has been started. Robert Stark will have charge of the brass foundry under the direction of A. M. Barry.

The Schaafe Machinery Co., Vancouver, B. C., will start work at once on the erection of a frame machine shop to cost \$5,000. Gardner & Mercer, Birke Building, Vancouver, are the architects.

The Winnipeg Ceiling & Roofing Co., Winnipeg, will build a mill and brick construction factory to cost \$10,000.

NEW TRADE PUBLICATIONS

Electric Hoists.—Link-Belt Co., Thirty-ninth Street and Stewart Avenue, Chicago. Book No. 246. Points out the advantages of the company's electric hoists which include simple construction, ready accessibility of parts and reliability and safety of operation. A list showing the great variety of work for which the hoists are being used is presented. The construction of the alternating and direct current types of hoist is gone into at some length, the text being supplemented by a number of illustrations. The various types of each that can be supplied are next shown and described and several dimension tables and diagrams are employed to supplement the descriptive matter. A number of illustrations of the various types of hoists in use are included.

Universal Grinding Machine.—Simmons Machine Co., Inc., Albany, N. Y. Circular. Shows a universal tool and cutter grinding machine of heavy construction for use in the modern tool room. A brief description of the construction of the machine and a condensed table of specifications supplement the illustration.

Titanium Aluminum Bronze.—Titanium Bronze Co., Inc., Niagara Falls, N. Y. Two booklets. The first relates to a bronze containing both titanium and aluminum which is claimed to possess the strength and toughness of manganese bronze and the wearing qualities of phosphor bronze, combined with acid resisting properties. A list of the parts

for which it can be used is presented as well as a number of photomicrographs of the different kinds of bronzes. The composition of the two grades that can be supplied is given and test results are included. The other pamphlet relates to the facilities possessed by the company for the production of die castings from this metal. Approximate composition and physical properties of the alloy are given, and the text is supplemented by a number of illustrations of parts produced in this way.

Oil Burners.—Hauck Mfg. Co., 140 Livingston Street, Brooklyn, N. Y. Bulletin No. 19A. Relates to the use of the oil burner as a source of heat supply in connection with machine and repair shop operations. Brief descriptions of the various types of burner that can be supplied are presented and a number of illustrations of the burners in use with brief descriptions of the work they were called upon to do are included.

Grinding Wheels.—American Emery Wheel Works, Providence, R. I. Reference card. Gives considerable useful information as to the speeds that are recommended for grinding wheels and the various grades and grains for handling different classes of work. The card consists of a celluloid holder and a slide upon which the various information is contained and may be read through slits in the casing.

Molding Machines.—Berkshire Mfg. Co., Cleveland. Collection of loose leaf circulars. Describe molding machines of the automatic and air-operated squeezer types. In addition to the description of the construction of the machines, the work for which they are adapted is mentioned, and instructions for their operation given. A number of illustrations of the different machines supplement the text description.

Iron and Wire Work.—J. E. Bolles Iron & Wire Works, 288 Milwaukee Avenue East, Detroit. Circular. Presents a brief description of the plant which has just been completed and the facilities possessed for turning out plain and ornamental iron, wire, brass and bronze work. The text is supplemented by a number of illustrations of various parts of the shop and specimens of the work produced in it.

Portable Elevator.—New York Revolving Portable Elevator Co., 344 Garfield Avenue, Jersey City, N. J. Bulletin No. 43. Covers some of the uses to which the Revolver can be put aside from the primary purpose of piling goods in storerooms and warehouses. These include the installation of overhead electric motors, an application which was illustrated in THE IRON AGE, April 26, 1917; for overhead drilling; for loading goods on trucks and freight cars, as well as piling inside of the latter, and for all forms of heavy lifting. The text matter is necessarily brief, the pictures being relied upon almost entirely to tell the story.

Power Presses.—Toledo Machine & Tool Co., Toledo, Ohio. Catalog No. 11 and pocket reference book. The first shows an extensive line of presses and other machinery, dies, and special tools. It is divided into 17 sections, each dealing with some particular class of machine. In general a brief description of the construction of the line of machines covered by each section is presented on the first page or two followed by illustrations and short descriptions of the different machines. A sectional index which will facilitate the finding of any particular machine is included, as well as a comprehensive telegraph code and tables of useful information. The reference book is intended to slip in the vest pocket and gives in much briefer form the information contained in the large catalog.

Safety Devices for Power Presses.—Zeh & Hahne-mann Co., Newark, N. J. Circular. Mentions a series of safety devices which are designed to cover almost any condition encountered in the operation of power presses. Illustrations of the different attachments which include gate and sensitive finger guards, a safety operating device and a treadle operated gate guard and clutch lock, are presented and brief descriptions of the devices and the work for which they are adapted are included.

Rock and Ore Crusher.—C. G. Buchanan Co., Inc., 90 West Street, New York. Bulletin No. 10. Illustrates and describes an all steel rock and ore crusher of the jaw type. The crusher is built in five standard sizes and is intended for quarry work in connection with large power shovels for preliminary crushing. The descriptive matter is illustrated by a number of views of the crusher, showing the details of construction and the various arrangements of drive that can be supplied.

Air Compressors.—Nagle Corliss Engine Works, Erie, Pa. Bulletin No. 29. Points out the advantages of using the company's short belt-driven air compressor. Among the points upon which emphasis is laid are a low initial cost, freedom from vibration and a small amount of floor space. Several views of the compressors are presented, together with dimension tables and diagrams.

Pressed Steel Bench Legs.—New Britain Machine Co.,

New Britain, Conn. Bulletin No. 1200-A. Contains illustrations and a brief description of a line of all steel bench legs for use in shops of all kinds. The various methods of planking the different types of legs are shown and the advantages of the steel leg construction as compared with an all wood bench or one employing cast legs are pointed out.

Gear Shaping Machine.—Fellows Gear Shaper Co., Springfield, Vt. Circular. Treats of the proper method of mounting and setting the cutter in the company's gear shaping machine. The circular is intended to be given to the operator and was prepared to furnish explicit and accurate instructions as to the correct method of operating the machine.

Rock and Diamond Core Drills.—Sullivan Machinery Company, 122 South Michigan Avenue, Chicago. Catalog No. 69 and Bulletins Nos. 70-D and 70-E. The catalog describes a line of diamond core drills for prospecting mines and mineral lands and for making test borings. The construction of the various drills is gone into in some detail, the text being supplemented by illustrations of the drills in use and their various parts. The process of drilling by this method is described and instructions for setting the diamond bits are included. The first bulletin pertains to a rock drill in which the piston and its rod and the steel bit reciprocate as one. The general features of this line of drills are briefly touched upon followed by descriptions somewhat in detail of the different styles that can be supplied and their accessories. Condensed specification tables and a number of views of the drills in use are included. The second bulletin relates to heavy rock drills for submarine work. Descriptions supplemented by numerous engravings of the different drills are presented and a number of views showing them in use are included.

Threading Tool.—Rivett Lathe & Grinder Co., Boston. Pamphlet. Refers to a threading tool for use in lathes to cut any of the standard screw threads. A brief description of the tool is given and the advantages of the improved model that is now being manufactured are emphasized. These include a positive position of the cutter while working, an increased range of adjustment and ease of making changes. A number of engravings of the tool and the different cutters that can be supplied are presented.

Adjustable Speed Motor.—Reliance Electric & Engineering Co., Cleveland. Bulletin No. 1014. Illustrates and describes a line of adjustable speed motors of the armature shifting design for use on direct current circuits. After a brief description of the principle of operation the forms of speed control are shown, together with the starting and reversing equipment employed. A number of illustrations of the motors in use for various kinds of service and a partial list of users are presented.

Swivel Pipe Joints.—Universal Valve Co., Burlington, Wis. Catalog. Relates to the Kno-Pak swivel joint for use in pipe lines conveying steam, air, gas or ammonia. The various types of joints, all of which are seated and held tightly against a ring of babbitt metal by the tension of a cast-iron spring, are illustrated and briefly described. A number of views of the joints in use are presented and a number of suggestions for their installation are included.

Pressed Steel Parts.—Guder, Paeschke & Frey Co., Milwaukee, Wis. Calendar measuring 9 x 9 3/4 in. Is designed as a desk convenience for those who desire to refer ahead frequently. The calendar contains the dates for 1918 and 1919 and is printed on heavy cardboard so that it can be hung up or placed in a desk drawer without likelihood of becoming damaged. Under each month the number of working days are shown and in the spaces for each day are given the number of days which have elapsed since the first of the year.

Plunger Pumps.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin W-400-25. Pertains to a line of outside packed plunger pattern pumps for general service. A sectional view of the water end of one of the pumps is presented, supplemented by a brief general description of the construction. The various pumps comprising the line are illustrated and described, a pair of facing pages being given to each style. The illustrations of the pumps are given on one page with a brief description and table of sizes and capacities on the facing one.

Rotary Shearing Machines.—Quickwork Co., St. Marys, Ohio. Circular. Calls attention to a rotary shearing machine for the production of various sizes and shapes from plate and sheet metal. Among the advantages claimed for the machine are an increased output and savings in labor, material and floor space. A brief description of the construction and operation of the machine is given, the text being supplemented by a condensed table of specifications and illustrations of parts that have been produced.

Conveying Machinery.—Link-Belt Co., Thirty-ninth Street and Stewart Avenue, Chicago. Two bulletins. The first, No. 340, is devoted to an installation of conveying machinery for sand and gravel which was made at the Raritan Ridge Clay Co., Metuchen, N. J. A brief description of the

equipment, supplemented by engravings of portions of it, is given. The other bulletin, No. 343, illustrates the construction and operation of the Watson bridge tramways and tower systems. Among the advantages claimed for this type of equipment are larger capacity with the same size of bucket, lower first cost and the elimination of the whipping around of the ropes. In both bulletins mention is made of the complete line of equipment which the company is prepared to supply for elevating and conveying material of all kinds, transmitting power, etc.

Electrical Supplies.—Western Electric Co., 195 Broadway, New York. 1918 Year Book. Size, 6 1/2 x 9 1/2 in.; pages, 1160. Lists some 50,000 different electrical supplies of all kinds. The various lines are illustrated and where necessary brief text descriptions are employed to supplement the illustrations. In practically every case tables of sizes are included.

Automatic Sealing Machine.—Johnson Automatic Sealer Co., Battle Creek, Mich. Pamphlet. Calls attention to an automatic sealing machine for handling from 20,000 to 35,000 packages per day. Mention is also made of a line of package conveying machinery and automatic scales which are also built.

Colored Lacquers.—Moller & Schumann Co., Marcy and Flushing avenues Brooklyn, N. Y. Bulletin No. 2. Refers to a line of colored lacquers or transparent color varnishes for use on manufactures of tin, polished nickel, aluminum, zinc, etc. The lacquers can be used for either air drying or baking and can be applied by brushing, dipping, spraying or by a coating machine. Reproductions of the six standard shades are given and mention is made of the various other enamel and Japan products of the company.

Carbonfree Metals.—Goldschmidt Thermit Co., 120 Broadway, New York. Pamphlet No. 20. Presents illustrations, brief descriptions and instructions for the use of a line of carbonfree metals. The various other metals and alloys that can be supplied by the company are also mentioned.

Oil Cups.—Gits Bros. Mfg. Co., 553 West Monroe Street, Chicago. Pamphlet. Describes and illustrates a line of self-closing spring lid oil cups that are made in several different styles. The cups are intended for all classes of lubricating work and in the pamphlet a separate page is devoted to each type. An illustration and brief description of the cup is given with a table of the different sizes that can be supplied underneath.

Pattern Makers' Machinery.—Oliver Machinery Co., Grand Rapids, Mich. Two bulletins. The first illustrates a universal saw bench and the various attachments that can be supplied for use with it. The description is brief but comprehensive and consists of a series of short paragraphs with sidehead titles in contrasting type. The other bulletin pertains to a wood turning face lathe having a swing of 8 1/2 in. over the floor. A condensed table of specifications supplements the descriptive matter and a number of illustrations of other pattern makers' lathes that can be supplied are included.

Scoop Conveyor.—Portable Machinery Co., Inc., 25 Park Place, Passaic, N. J. Circular. Illustrates a scoop conveyor for loading and unloading, storing and reclaiming coal, coke, ore, stone, sand, manufactured products and sacks and packages. A concise description of the conveyor, which is of the portable belt type, is presented, together with views and diagrams of installations.

Electroplating and Polishing Supplies.—Hanson & Van Winkle Co., 269 Oliver Street, Newark, N. J. Catalog No. 21. Size 6 x 9 in.; pages, 276. This is the company's latest catalog illustrating and describing a line of electroplating and polishing supplies which includes chemicals, polishing lathes, grinding machinery, dynamos and lacquers. The catalog is arranged so that the dynamos and their accessories are first presented followed by the apparatus employed in connection with the plating operation. After this come the chemicals, cleaning compounds, polishing and buffing lathes and wheels, etc. Tables giving the various sizes of the different pieces of equipment are included.

Cork Insulating Brick.—Armstrong Cork & Insulation Co., Pittsburgh. Folder. Mentions the use which may be made of the Nonpareil insulating brick in boiler settings. A brief description of the bricks, which are composed of a mixture of diatomaceous earth and finely ground cork, is given, and the results of a number of tests that have been made on the bricks as a heat insulating material in boiler settings are included.

Punching and Shearing Machines.—Cleveland Punch & Shear Works Co., Cleveland. Calendar. Is of the same general type as those previously issued by the company, the dates for the working days of each week, commencing Oct. 1, 1917, and extending to March 30, 1918, being given on a separate leaf. Illustrations of various types of punching and shearing machines and the dies, punches and other tools used in connection with them are presented on the front of the leaf with a specification sheet and order blank on the back.

